

**STANDARDS PRESENTATION  
TO  
CALIFORNIA OCCUPATIONAL SAFETY AND HEALTH STANDARDS BOARD**

Attachment No. 1

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PROPOSED STATE STANDARD,  
TITLE 8, DIVISION 1, CHAPTER 4

TITLE 8: Division 1, Chapter 4, Subchapter 4, Construction Safety Orders  
Article 18. Access and Egress

Amend Section 1629 as follows:

§1629. Stairways and Ladders.

(a) Scope and application. This section applies to all stairways and ladders used in construction, alteration, repair (including painting and decorating), and demolition workplaces covered under the Construction Safety Orders, and also sets forth, in specified circumstances, when ladders and stairways are required to be provided. Additional requirements for ladders used on or with scaffolds are contained in Article 21 – Scaffolds. This section does not apply to integral components of equipment covered by General Industry Safety Orders, Group 13, Cranes and Other Hoisting Equipment which exclusively sets forth the circumstances when ladders and stairways shall be provided on equipment covered by those orders.

(b) ~~(a)~~ General.

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(c) ~~(b)~~ Buildings.

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(d) ~~(c)~~ Ladder Use.

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NOTE: Authority and reference cited: Section 142.3, Labor Code.

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TITLE 8: Division 1, Chapter 4, Subchapter 4, Construction Safety Orders  
Article 28. Miscellaneous Construction Tools and Equipment

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Amend Section 1694 as follows:

§1694. Sideboom Cranes.

(a) Sideboom cranes mounted on wheel or crawler tractors shall meet the requirements of SAE J 743 DEC80.

(b) The provisions of General Industry Safety Orders, Group 13 (Cranes and Other Hoisting Equipment), apply, except §4991.1 (Ground Conditions), §5015 (Safety Devices), §5016 (Operational Aids), §5006 and §5006.1 (Operator Qualification and Certification).

(c) Section 5002.1 (Boom and Load Line Free Fall) applies, except subsection 5002.1(a)(2)(A). Sideboom cranes in which the boom is designed to free fall (live boom) are permitted only if manufactured prior to [Effective date].

NOTE: Authority cited: Section 142.3, Labor Code. Reference: Section 142.3, Labor Code.

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TITLE 8: Division 1, Chapter 4, Subchapter 5. Electrical Safety Orders  
Group 2, High-Voltage Electrical Safety Orders  
Article 36. Work Procedures and Operating Procedures

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Amend Section 2940.7 as follows:

§2940.7. Mechanical Equipment.

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(c) Derrick Trucks, Cranes and Other Lifting Equipment.

(1) Derrick trucks, cranes and other lifting equipment shall comply with Articles 91 through 100 of the General Industry Safety Orders except:

(A) as stated in Section 2946 of these orders relating to clearance (for clearances in this section see Section 2940.2(b) Table 2940.2), and

(B) derrick trucks (electric line trucks) shall not be required to comply with ANSI B30.5 and B30.6 as referenced in Section 4884, General Industry Safety Orders, Title 8, California Code of Regulations.

(2) With the exception of equipment certified for work on the proper voltage, mechanical equipment shall not be operated closer to any energized conductor or exposed energized parts of equipment than the clearances set forth in Section 2940.2(b) Table 2940.2 unless, in addition to the requirements of Section 5003.3:

(A) an insulated barrier is installed between the energized part and the mechanical equipment, or

(B) the mechanical equipment is insulated.

(3) When setting, moving, or removing poles using cranes, derricks, gin poles, A-frames, or other mechanized equipment near energized conductors or equipment, precautions shall be taken to avoid contact with energized conductors or exposed energized parts of equipment except where barriers or protective devices are used.

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NOTE: Authority cited: Section 142.3, Labor Code. Reference: Section 142.3, Labor Code.

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TITLE 8: Division 1, Chapter 4, Subchapter 5. Electrical Safety Orders  
Group 2, High-Voltage Electrical Safety Orders  
Article 37. Provisions for Preventing Accidents Due to Proximity to Overhead Lines

Amend Section 2946 as follows:

§2946. Provisions for Preventing Accidents Due to Proximity to Overhead Lines.

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(d) Any overhead conductor shall be considered to be energized unless and until the person or electrical utility authority owning or operating such line verifies that the line is not energized, and the line is visibly grounded at the work site.

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NOTE: Authority cited: Section 142.3, Labor Code. Reference: Section 142.3, Labor Code.

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TITLE 8: Division 1, Chapter 4, Subchapter 7. General Industry Safety Orders  
Article 2. Standard Specifications

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Amend Section 3234 as follows:

§3234. Fixed Industrial Stairs.

(a) Scope. This Section contains specifications for the safe design and construction of fixed general industrial stairs. This classification includes interior and exterior stairs around machinery, tanks, and other equipment, and stairs leading to or from floors, platforms, or pits. This Section does not apply to stairs used for required exit purposes, to construction operations, to integral components of equipment covered by Group 13 (Cranes and Other Hoisting Equipment), to private residences, or to articulated stairs, such as may be installed on floating roof tanks or on dock facilities, the angle of which changes with the rise and fall of the base support. ~~(Title 24, Part 2, Section 2-3326(a).)~~

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NOTE: Authority cited: Section 142.3, Labor Code. Reference: Section 142.3, Labor Code.

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TITLE 8: Division 1, Chapter 4, Subchapter 7. General Industry Safety Orders  
Group 13, Cranes and Other Hoisting Equipment

Amend Section 4884 as follows:

§4884. Scope.

(a) ~~The Orders in this Group shall apply to derricks, cranes, and boom-type excavators, but they shall not apply to aerial devices designed and used for positioning personnel (See Article 24).~~ power operated equipment, that can hoist, lower and horizontally move a suspended load. Such equipment includes, but is not limited to: Articulating cranes (such as knuckle-boom cranes); crawler cranes; floating cranes; cranes on barges; locomotive cranes; mobile cranes (such as wheel-mounted, rough-terrain, all-terrain, commercial truck-mounted, and boom truck cranes); multi-purpose machines when configured to hoist and lower (by means of a winch or hook) and horizontally move a suspended load; industrial cranes (such as carry-deck cranes); dedicated pile drivers; service/mechanic trucks with a hoisting device; a crane on a monorail; tower cranes (such as a fixed jib, i.e., “hammerhead boom”), luffing boom and self-erecting; pedestal cranes; portal cranes; overhead and gantry cranes; straddle cranes; sideboom cranes; derricks; and variations of such equipment. However, items listed in subsection (c) are excluded from the scope of this standard.

~~(b) Hammerhead tower cranes manufactured on or before June 23, 1999:~~

~~(1) Hammerhead tower cranes manufactured prior to September 28, 1986, shall be designed, constructed, and installed in accordance with American National Standards Institute (ANSI) B30.3 1975, Hammerhead Tower Cranes, which is hereby incorporated by reference.~~

~~(2) Hammerhead tower cranes manufactured on September 28, 1986 through May 16, 1993, shall be designed, constructed, and installed in accordance with ANSI/American Society of Mechanical Engineers (ASME) B30.3 1984, Hammerhead Tower Cranes, which is hereby incorporated by reference.~~

~~(3) Hammerhead tower cranes manufactured after May 16, 1993 through June 23, 1999, shall be designed, constructed and installed in accordance with ASME B30.3 1990, Hammerhead Tower Cranes, which is hereby incorporated by reference. NOTE: See Section 4884(c)(1)(B) for standards pertaining to hammerhead tower cranes manufactured after June 23, 1999.~~

*[Ed note: Existing subsection 4884(b) relocated in its entirety to subsection 4884.1]*

(b) Attachments. This standard applies to equipment included in subsection (a) when used with attachments. Such attachments, whether crane-attached or suspended include, but are not limited to: Hooks, magnets, grapples, clamshell buckets, orange peel buckets, concrete buckets, drag lines, personnel platforms, augers or drills and pile driving equipment.

~~(c)(1)(A) Cranes and derricks manufactured on or after September 28, 1986, through June 23, 1999, shall be designed, constructed and installed in accordance with the following applicable~~

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~~American National Standards Institute (ANSI) and/or American Society of Mechanical Engineers (ASME) standards or those listed in subsection (c)(1)(B):~~

~~B30.2 1983, Overhead and Gantry Cranes (Top Running Bridge Multiple Girder)~~

~~B30.4 1981, Portal, Tower and Pillar Cranes~~

~~B30.5 1982, Crawler, Locomotive and Truck Cranes~~

~~B30.6 1977, Derricks~~

~~B30.7 1977, Base Mounted Drum Hoists~~

~~B30.8 1982, Floating Cranes and Floating Derricks~~

~~B30.11 1980, Monorails and Underhung Cranes~~

~~B30.13 1977, Controlled Mechanical Storage Cranes~~

~~B30.17 1980, Overhead and Gantry Cranes (Top Running Bridge, Single Girder, Underhung Hoist)~~

~~(B) Cranes and derricks manufactured after June 23, 1999 shall be designed, constructed and installed in accordance with the following applicable American National Standards Institute (ANSI)/American Society of Mechanical Engineers (ASME) standards which are hereby incorporated by reference:~~

~~B30.2 1996, Overhead and Gantry Cranes (Top Running Bridge, Single or Multiple Girder, Top Running Trolley Hoist)~~

~~B30.3 1996, Construction Tower Cranes (includes Hammerhead Tower Cranes)~~

~~B30.4 1996, Portal, Tower and Pedestal Cranes~~

~~B30.5 1994, Mobile and Locomotive Cranes~~

~~B30.6 1995, Derricks~~

~~B30.7 1994, Base Mounted Drum Hoists~~

~~B30.8 1993, Floating Cranes and Floating Derricks~~

~~B30.11 1993, Monorails and Underhung Cranes~~

~~B30.13 1996, Storage/Retrieval (S/R) Machines and Associated Equipment~~

~~B30.17 1992, Overhead and Gantry Cranes (Top Running Bridge, Single Girder, Underhung Hoist)~~

~~(2) Articulating boom cranes manufactured after May 16, 1993 shall conform to these regulations and be provided with a permanently attached metal label stating that the equipment has been designed and constructed in accordance with ASME/ANSI B30.22 1987, and B30.22a-1988 Addenda, Articulating Boom Cranes, herein incorporated by reference, or has been approved as required by the provisions of Section 3206 of these orders.~~

~~*[Ed note: Existing subsection 4884(c) relocated in its entirety to subsection 4884.1]*~~

~~(c) Exclusions. This Group 13 does not cover:~~

~~(1) Machinery included in subsection (a) while it has been converted or adapted for a non-hoisting/lifting use. Such conversions/adaptations include, but are not limited to, power shovels, excavators and concrete pumps.~~

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(2) Power shovels, excavators, wheel loaders, backhoes, loader backhoes, track loaders. This machinery is also excluded when used with chains, slings or other rigging to lift suspended loads.

(3) Automotive wreckers and tow trucks when used to clear wrecks and haul vehicles.

(4) Digger derricks when used for augering holes for poles carrying electric and telecommunication lines, placing and removing the poles, and for handling associated materials to be installed on or removed from the poles.

(A) Digger derricks used in work subject to the Electrical Safety Orders shall comply with Section 2940.7 of those Safety Orders.

(B) Digger derricks used in construction work for telecommunication service (as defined in the Telecommunication Safety Orders) shall comply with those Safety Orders.

(5) Machinery originally designed as vehicle-mounted aerial devices (for lifting personnel) and self-propelled elevating work platforms.

(6) Telescopic/hydraulic gantry systems.

(7) Stacker cranes.

(8) Powered industrial trucks (forklifts), except when configured to hoist and lower (by means of a winch or hook) and horizontally move a suspended load.

(9) Mechanic's truck with a hoisting device when used in activities related to equipment maintenance and repair.

(10) Machinery that hoists by using a come-a-long or chainfall.

(11) Dedicated drilling rigs.

(12) Gin poles when used for the erection of communication towers.

(13) Anchor handling or dredge related operations with a vessel or barge using an affixed A-frame.

(14) Roustabouts.

(15) Helicopter cranes.

~~(d)(1) Except as provided in subsection (d)(2), all cranes and derricks manufactured prior to September 28, 1986, shall conform to this subsection and shall be designed, constructed and installed in accordance with the following applicable ANSI standards:~~

~~B30.2-1967, Overhead and Gantry Cranes~~

~~B30.4-1973, Portal, Tower, and Pillar Cranes~~

~~B30.5-1968, Crawler, Locomotive and Truck Cranes~~

~~B30.6-1969, Derricks~~

~~B30.15-1973, Mobile Hydraulic Cranes~~

~~Exception: Section 15-1.3.2(d) of B30.15-1973, Two-Blocking Damage Prevention Feature.~~

~~(2) Cranes manufactured prior to January 15, 1974, shall be modified to comply with applicable regulations in Group 13, Cranes and Other Hoisting Equipment of the General Industry Safety Orders, unless it can be shown during the process of certification that a crane cannot feasibly or economically be modified to comply with any one or more applicable requirements and the crane~~



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~~substantially complies with applicable Group 13 regulations and the ANSI or other design standard to which the crane was manufactured.~~

*[Ed note: Existing subsection 4884(d) relocated in its entirety to subsection 4884.1]*

~~(e) Cranes and derricks which do not meet the applicable ANSI standards shall be designed, constructed and installed in accordance with the recommendations of a currently registered mechanical or civil engineer.~~

*[Ed note: Existing subsection 4884(e) relocated in its entirety to subsection 4884.2(a)]*

~~(f) Cranes and derricks shall be operated, tested, inspected and maintained in accordance with these Orders.~~

*[Ed note: Existing subsection 4884(f) relocated in its entirety to subsection 4884.2(b)]*

~~(g) All electrically powered cranes and derricks shall also comply with applicable electrical safety orders.~~ *[Ed note: Existing subsection 4884(g) relocated in its entirety to subsection 4884.2(c)]*

NOTE: Authority cited: Section 142.3, Labor Code. Reference: Section 142.3, Labor Code.

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Add new section 4884.1 as follows:

§4884.1. Design Standards.

(a) Hammerhead tower cranes manufactured on or before June 23, 1999:

(1) Hammerhead tower cranes manufactured prior to September 28, 1986, shall be designed, constructed, and installed in accordance with American National Standards Institute (ANSI) B30.3-1975, Hammerhead Tower Cranes, which is hereby incorporated by reference.

(2) Hammerhead tower cranes manufactured on September 28, 1986 through May 16, 1993, shall be designed, constructed, and installed in accordance with ANSI/American Society of Mechanical Engineers (ASME) B30.3-1984, Hammerhead Tower Cranes, which is hereby incorporated by reference.

(3) Hammerhead tower cranes manufactured after May 16, 1993 through June 23, 1999, shall be designed, constructed and installed in accordance with ASME B30.3-1990, Hammerhead Tower Cranes, which is hereby incorporated by reference. ~~NOTE: See Section 4884(c)(1)(B) for standards pertaining to hammerhead tower cranes manufactured after June 23, 1999.~~

*[Ed note: Existing 4884.1(a) relocated verbatim from 4884(b)]*

(b) Cranes and derricks manufactured on or after September 28, 1986, through June 23, 1999, shall be designed, constructed and installed in accordance with the following applicable American National Standards Institute (ANSI) and/or American Society of Mechanical Engineers (ASME) standards or those listed in subsection (c):

B30.2-1983, Overhead and Gantry Cranes (Top Running Bridge Multiple Girder)

B30.4-1981, Portal, Tower and Pillar Cranes

B30.5-1982, Crawler, Locomotive and Truck Cranes

B30.6-1977, Derricks

B30.7-1977, Base Mounted Drum Hoists

B30.8-1982, Floating Cranes and Floating Derricks

B30.11-1980, Monorails and Underhung Cranes

B30.13-1977, Controlled Mechanical Storage Cranes

B30.17-1980, Overhead and Gantry Cranes (Top Running Bridge, Overhead and Gantry Cranes (Top Running Bridge, Single Girder, Underhung Hoist)

*[Ed note: Existing subsection 4884.1(b) has been relocated verbatim from 4884(c)(1)(A)]*

(c) Cranes and derricks manufactured after June 23, 1999, through **[1 day prior to effective date]** shall be designed, constructed and installed in accordance with the following applicable American National Standards Institute (ANSI)/American Society of Mechanical Engineers (ASME) standards which are hereby incorporated by reference:

B30.2-1996, Overhead and Gantry Cranes (Top Running Bridge, Single or Multiple Girder, Top Running Trolley Hoist)

B30.3-1996, Construction Tower Cranes (includes Hammerhead Tower Cranes)

B30.4-1996, Portal, Tower and Pedestal Cranes

B30.5-1994, Mobile and Locomotive Cranes

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B30.6-1995, Derricks

B30.7-1994, Base Mounted Drum Hoists

B30.8-1993, Floating Cranes and Floating Derricks

B30.11-1993, Monorails and Underhung Cranes

B30.13-1996, Storage/Retrieval (S/R) Machines and Associated Equipment

B30.17-1992, Overhead and Gantry Cranes (Top Running Bridge, Single Girder, Underhung Hoist)

*[Ed note: Existing subsection 4884.1(c) has been relocated from 4884(c)(1)(B)]*

(d) Cranes and derricks manufactured after [Effective date] shall be designed, constructed and installed in accordance with the following applicable American National Standards Institute (ANSI)/American Society of Mechanical Engineers (ASME) standards which are hereby incorporated by reference:

ASME B30.2–2005, Overhead and Gantry Cranes (Top Running Bridge, Single or Multiple Girder, Top Running Trolley Hoist), issued Dec. 30, 2005.

B30.3-1996, Construction Tower Cranes (includes Hammerhead Tower Cranes) *[Ed note: feds did not update]*

B30.4-1996, Portal, Tower and Pedestal *[Ed note: feds did not update]*

ASME B30.5–2004, Mobile and Locomotive Cranes, issued Sept. 27, 2004.

B30.6-1995, Derricks *[Ed note: feds did not update]*

ASME B30.7–2001, Base-Mounted Drum Hoists, issued Jan. 21, 2002.

B30.8-1982, Floating Cranes and Floating Derricks *[Ed note: feds did not update]*

B30.11-1980, Monorails and Underhung Cranes *[Ed note: feds did not update]*

B30.13-1977, Controlled Mechanical Storage Cranes *[Ed note: feds did not update]*

ASME B30.14–2004, Side Boom Tractors, issued Sept. 20, 2004

B30.17-1992, Overhead and Gantry Cranes (Top Running Bridge, Single Girder, Underhung Hoist)

(1) In addition, cranes and derricks manufactured after [Effective date] shall be designed, constructed and installed in accordance with the following standards which are hereby incorporated by reference:

(A) AWS D1.1/D1.1M:2002, Structural Welding Code—Steel, 18th ed., ANSI approved Aug. 31, 2001.

(B) ANSI/AWS D14.3–94, Specification for Welding Earthmoving and Construction Equipment, ANSI approved Jun. 11, 1993.

(C) BS EN 13000:2004, Cranes—Mobile Cranes, published Jan. 4, 2006.

(D) BS EN 14439:2006, Cranes—Safety—Tower Cranes, published Jan. 31, 2007.

(E) ISO 11660–1:2008(E), Cranes—Access, guards and restraints—Part 1: General, 2d ed., Feb. 15, 2008.

(F) ISO 11660–2:1994(E), Cranes—Access, guards and restraints—Part 2: Mobile cranes, 1994.

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(G) ISO 11660–3:2008(E), Cranes—Access, guards and restraints—Part 3: Tower cranes, 2d ed., Feb. 15, 2008.

(H) PCSA Std. No. 2, Mobile Hydraulic Crane Standards, 1968.

(I) SAE J185 (reaf. May 2003), Access Systems for Off-Road Machines, reaffirmed May 2003.

(J) SAE J987 (rev. Jun. 2003), Lattice Boom Cranes—Method of Test, revised Jun. 2003.

(K) SAE J1063 (rev. Nov. 1993), Cantilevered Boom Crane Structures—Method of Test, revised Nov. 1993.

(e) Articulating boom cranes manufactured after May 16, 1993 shall conform to these regulations and be provided with a permanently attached metal label stating that the equipment has been designed and constructed in accordance with ASME/ANSI B30.22-1987, and B30.22a-1988 Addenda, Articulating Boom Cranes, herein incorporated by reference, or has been approved as required by the provisions of Section 3206 of these orders.

*[Ed note: Subsection 4884(e) has been relocated from 4884(c)(2)]*

(f)(1) Except as provided in subsection (f)(2), all cranes and derricks manufactured prior to September 28, 1986, shall conform to this subsection and shall be designed, constructed and installed in accordance with the following applicable ANSI standards:

B30.2-1967, Overhead and Gantry Cranes

B30.4-1973, Portal, Tower, and Pillar Cranes

B30.5-1968, Crawler, Locomotive and Truck Cranes

B30.6-1969, Derricks

B30.15-1973, Mobile Hydraulic Cranes

EXCEPTION: Section 15-1.3.2(d) of B30.15-1973, Two-Blocking Damage Prevention Feature.

*[Ed note: Subsection (f)(1) has been relocated from 4884(d)(1)]*

(2) Cranes manufactured prior to January 15, 1974, shall be modified to comply with applicable regulations in Group 13, Cranes and Other Hoisting Equipment of the General Industry Safety Orders, unless it can be shown during the process of certification that a crane cannot feasibly or economically be modified to comply with any one or more applicable requirements and the crane substantially complies with applicable Group 13 regulations and the ANSI or other design standard to which the crane was manufactured.

*[Ed note: Subsection 4884(f)(2) has been relocated from 4884(d)(2)]*

NOTE: Authority cited: Section 142.3, Labor Code. Reference: Section 142.3, Labor Code.

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Add new section 4884.2 as follows:

§4884.2. General.

(a) Cranes and derricks which do not meet the applicable ANSI standards shall be designed, constructed and installed in accordance with the recommendations of a currently registered mechanical or civil engineer. [Ed note: relocated from 4884(e)]

(b) Cranes and derricks shall be operated, tested, inspected and maintained in accordance with these Orders. [Ed note: relocated from 4884(f)]

(c) All electrically powered cranes and derricks shall also comply with applicable electrical safety orders. [Ed note: relocated from 4884(g)]

(d) For work covered by the High-Voltage Electrical Safety Orders, compliance with those Orders is deemed compliance with §§4991.2, 4992.3, 5003.1, 5003.2, and 5003.3.

(e) Section 4991.1 does not apply to cranes designed for use on railroad tracks, when used on railroad tracks that are part of the general railroad system of transportation that is regulated pursuant to the Federal Railroad Administration under 49 CFR part 213, and that comply with applicable Federal Railroad Administration requirements. See §4991.1(f).

(f) All sections of Group 13 apply to the equipment covered by this standard unless specified otherwise.

(g) Prototype testing: Cranes manufactured on or after November 8, 2010 shall meet the prototype testing requirements prescribed in 29 CFR 1926.1433 and with Section 5020 and standards incorporated by reference in Section 4884.1 (Design Standards) where more protective.

(h) Posted warnings. Posted warnings required by Group 13 as well as those originally supplied with the equipment by the manufacturer shall be maintained in legible condition.

NOTE: Authority cited: Section 142.3, Labor Code. Reference: Section 142.3, Labor Code.

Add new Section 4884.3 to read:

§4884.3. Training - Administration.

(1) The employer shall evaluate each employee required to be trained under Group 13 and these Orders to confirm that the employee understands the information provided in the training.

(2) The employer shall provide refresher training in relevant topics for each employee when, based on the conduct of the employee or an evaluation of the employee's knowledge, there is an indication that retraining is necessary.

(3) Whenever training is required under Group 13, the employer shall provide the training at no cost to the employee.

NOTE: Authority cited: Section 142.3, Labor Code. Reference: Section 142.3, Labor Code.

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TITLE 8: Division 1, Chapter 4, Subchapter 7. General Industry Safety Orders  
Group 13, Article 91. Definitions

Amend Section 4885 as follows:

§4885. Definitions.

\*\*\*

A/D Director (Assembly/Disassembly Director). An individual who meets this section's requirements for an A/D director, irrespective of the person's formal job title or whether the person is non-management or management personnel.

\*\*\*

Articulating Boom Crane. A crane articulated by hydraulic cylinders, powered by an internal combustion engine or electric motor, whose boom consists of a series of folding, pin connected structural members, typically manipulated to extend or retract by power from hydraulic cylinders.

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Assembly/Disassembly. The assembly and/or disassembly of equipment covered under this standard. With regard to tower cranes, "erecting and climbing" replaces the term "assembly," and "dismantling" replaces the term "disassembly." Regardless of whether the crane is initially erected to its full height or is climbed in stages, the process of increasing the height of the crane is an erection process.

Assist crane. A crane used to assist in assembling or disassembling a crane.

Attachment(s). Any device that expands the range of tasks that can be done by the equipment. Examples include, but are not limited to: An auger, drill, magnet, pile-driver, and boom-attached personnel platform.

Audible Signal. A signal made by a distinct sound or series of sounds. Examples include, but are not limited to, sounds made by a bell, horn, or whistle.

Blocking (also referred to as "cribbing") is wood or other material used to support equipment or a component and distribute loads to the ground. It is typically used to support lattice boom sections during assembly/disassembly and under outrigger and stabilizer floats.

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Boatswain's Chair. A single-point adjustable suspension scaffold consisting of a seat or sling (which may be incorporated into a full body harness) designed to support one employee in a sitting position.

Bogie means "travel bogie," which is defined below.

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Boom. A member section of a crane or derrick, the lower end of which is affixed to a mast, base, carriage, or support, and the upper end supports a hook or other end attachment. The length of the boom shall be taken as the straight line distance between the axis of the foot pin and the axis of the end sheave pin.

Boom (equipment other than tower crane). An inclined spar, strut, or other long structural member which supports the upper hoisting tackle on a crane or derrick. Typically, the length and vertical angle of the boom can be varied to achieve increased height or height and reach when lifting loads. Booms can usually be grouped into general categories of hydraulically extendible, cantilevered type, latticed section, cable-supported type or articulating type.

Boom (tower cranes): On tower cranes, if the "boom" (i.e., principal horizontal structure) is fixed, it is referred to as a jib; if it is moveable up and down, it is referred to as a boom.

Boom Angle. The angle between the longitudinal centerline of the boom and the horizontal. The boom longitudinal centerline is a straight line between the boom foot pin (heel pin) centerline and boom point sheave pin centerline.

Boom angle indicator. A device which measures the angle of the boom relative to horizontal.

Boom Hoist. A hoist drum and rope reeving system used to raise and lower the boom. The rope system may be all live reeving or a combination of live reeving and pendants.

Boom hoist limiting device includes boom hoist disengaging device, boom hoist shut-off, boom hoist disconnect, boom hoist hydraulic relief, boom hoist kick-outs, automatic boom stop device, or derricking limiter. This type of device disengages boom hoist power when the boom reaches a predetermined operating angle. It also sets brakes or closes valves to prevent the boom from lowering after power is disengaged.

Boom length indicator indicates the length of the permanent part of the boom (such as ruled markings on the boom) or, as in some computerized systems, the length of the boom with extensions/attachments.

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Boomstop. A device used to limit the angle of the boom at the highest position. Boom stop includes boom stops, (belly straps with struts/standoff), telescoping boom stops, attachment boom stops, and backstops. These devices restrict the boom from moving above a certain maximum angle and toppling over backward.

Boom suspension system. A system of pendants, running ropes, sheaves, and other hardware which supports the boom tip and controls the boom angle.

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Builder. The builder/constructor of equipment.

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Center of gravity: The center of gravity of any object is the point in the object around which its weight is evenly distributed. If you could put a support under that point, you could balance the object on the support.

\*\*\*

Certificating Agency. Certificating agencies are qualified agencies, and/or persons, licensed by the Division to examine, test and certify cranes and derricks in accordance with Sections 344.60 through 344.67 of Title 8 of the California Code of Regulations.

Certified Agent. The manufacturer, or a person who is currently registered as a professional civil, mechanical, or structural engineer by the State of California and is knowledgeable in the structure and use of the equipment.

Certified welder. A welder who meets nationally recognized certification requirements applicable to the task being performed.

\*\*\*

Climbing. The process in which a tower crane is raised to a new working height, either by adding additional tower sections to the top of the crane (top climbing), or by a system in which the entire crane is raised inside the structure (inside climbing).

Come-a-long. A mechanical device typically consisting of a chain or cable attached at each end that is used to facilitate movement of materials through leverage.

Competent person means one who is capable of identifying existing and predictable hazards in the surroundings or working conditions which are unsanitary, hazardous, or dangerous to employees, and who has authorization to take prompt corrective measures to eliminate them.



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Controlled load lowering. Lowering a load by means of a mechanical hoist drum device that allows a hoisted load to be lowered with maximum control using the gear train or hydraulic components of the hoist mechanism. Controlled load lowering requires the use of the hoist drive motor, rather than the load hoist brake, to lower the load.

\*\*\*

Controlling entity. An employer that is a prime contractor, general contractor, construction manager or any other legal entity which has the overall responsibility for the construction of the project – its planning, quality and completion.

Counterweight. A weight used to supplement the weight of the machine in providing stability for lifting working loads by counterbalancing those loads.

Crane. A machine for lifting or lowering a load and moving it horizontally, in which the hoisting mechanism is an integral part of the machine. It may be driven manually or by power and may be a fixed or a mobile machine, but does not include stackers, lift trucks, power shovels, backhoes, or excavators. Some of the common types of cranes are defined as follows:

\*\*\*

Crossover points. Locations on a wire rope which is spooled on a drum where one layer of rope climbs up on and crosses over the previous layer. This takes place at each flange of the drum as the rope is spooled onto the drum, reaches the flange, and begins to wrap back in the opposite direction.

\*\*\*

Dedicated channel. A line of communication assigned by the employer who controls the communication system to only one signal person and crane/derrick or to a coordinated group of cranes/derricks/signal person(s).

Dedicated pile-driver is a machine that is designed to function exclusively as a pile-driver. These machines typically have the ability to both hoist the material that will be pile-driven and to pile-drive that material.

Dedicated spotter (power lines): To be considered a dedicated spotter, the requirements of §5001.3 (Signal person qualifications) must be met and his/her sole responsibility is to watch the separation between the power line and the equipment, load line and load (including rigging and lifting accessories), and ensure through communication with the operator that the applicable minimum approach distance is not breached.

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Directly under the load. A part or all of an employee is directly beneath the load.

Dismantling includes partial dismantling (such as dismantling to shorten a boom or substitute a different component).

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Drum rotation indicator. A device on a crane or hoist which indicates in which direction and at what relative speed a particular hoist drum is turning.

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Electrical contact occurs when a person, object, or equipment makes contact or comes in close proximity with an energized conductor or equipment that allows the passage of current.

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Employer-made equipment means floating cranes/derricks designed and built by an employer for the employer's own use.

Encroachment is where any part of the crane, load line or load (including rigging and lifting accessories) breaches a minimum clearance distance that this Group 13 requires to be maintained from a power line.

Equipment criteria means instructions, recommendations, limitations and specifications.

Fall protection equipment. Guardrail systems, safety net systems, personal fall arrest systems, positioning device systems or fall restraint systems.

Fall restraint system. A fall protection system that prevents the user from falling any distance. The system is comprised of either a body belt or body harness, along with an anchorage, connectors and other necessary equipment. The other components typically include a lanyard, and may also include a lifeline and other devices.

Fall zone. The area (including but not limited to the area directly beneath the load) in which it is reasonably foreseeable that partially or completely suspended materials could fall in the event of an accident.

Flange points are points of contact between rope and drum flange where the rope changes layers.

Floating cranes/derricks. Equipment designed by the manufacturer (or employer) for marine use by permanent attachment to a barge, pontoons, vessel or other means of flotation.

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For example means “one example, although there are others.”

Free fall (of the load line) means that only the brake is used to regulate the descent of the load line (the drive mechanism is not used to drive the load down faster or retard its lowering).

Free surface effect is the uncontrolled transverse movement of liquids in compartments which reduce a vessel’s transverse stability.

Hoist. A mechanical device for lifting and lowering loads by winding a line onto or off a drum. An apparatus for raising or lowering a load by the application of a pulling force, but does not include a car or platform riding in guides. Some common types of hoists are defined as follows:

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Include/including means “including, but not limited to.”

Insulating link/device. An insulating device listed, labeled, or accepted by a Nationally Recognized Testing Laboratory in accordance with 29 CFR 1910.7.

Jib stop (also referred to as a jib backstop), is the same type of device as a boom stop but is for a fixed or luffing jib.

Land crane/derrick is equipment not originally designed by the manufacturer for marine use by permanent attachment to barges, pontoons, vessels, or other means of floatation.

\*\*\*

List. The angle of inclination about the longitudinal axis of a barge, pontoons, vessel or other means of floatation.

Load (Working). The external load in pounds applied on the hoisting line, including the weight of load attaching equipment such as load blocks, shackles, slings, buckets, and magnets. refers to the object(s) being hoisted and/or the weight of the object(s); both uses refer to the object(s) and the load-attaching equipment, such as, the load block, ropes, slings, shackles, and any other ancillary attachment.

Load moment (or rated capacity) indicator. A system which aids the equipment operator by sensing (directly or indirectly) the overturning moment on the equipment, i.e., load multiplied by radius. It compares this lifting condition to the equipment’s rated capacity, and indicates to the operator the percentage of capacity at which the equipment is working. Lights, bells, or buzzers may be incorporated as a warning of an approaching overload condition.

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Load moment (or rated capacity) limiter. A system which aids the equipment operator by sensing (directly or indirectly) the overturning moment on the equipment, i.e., load multiplied by radius. It compares this lifting condition to the equipment's rated capacity, and when the rated capacity is reached, it shuts off power to those equipment functions which can increase the severity of loading on the equipment, e.g., hoisting, telescoping out, or luffing out. Typically, those functions which decrease the severity of loading on the equipment remain operational, e.g., lowering, telescoping in, or luffing in.

Locomotive crane. A crane mounted on a base or car equipped for travel on a railroad track.

Luffing jib limiting device is similar to a boom hoist limiting device, except that it limits the movement of the luffing jib.

\*\*\*

Marine hoisted personnel transfer device. A device, such as a "transfer net," that is designed to protect the employees being hoisted during a marine transfer and to facilitate rapid entry into and exit from the device. Such devices do not include boatswain's chairs when hoisted by equipment covered by this standard.

Marine worksite. A construction worksite located in, on or above the water.

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Mobile crane. A lifting device incorporating a cable suspended latticed boom or hydraulic telescopic boom designed to be moved between operating locations by transport over the road.

\*\*\*

Moving point-to-point means the times during which an employee is in the process of going to or from a work station.

Multi-purpose machine. A machine that is designed to be configured in various ways, at least one of which allows it to hoist (by means of a winch or hook) and horizontally move a suspended load. For example, a machine that can rotate and can be configured with removable forks/tongs (for use as a forklift) or with a winch pack, jib (with a hook at the end) or jib used in conjunction with a winch. When configured with the forks/tongs, it is not covered by this standard. When configured with a winch pack, jib (with a hook at the end) or jib used in conjunction with a winch, it is covered by this standard.

Nonconductive means that, because of the nature and condition of the materials used, and the conditions of use (including environmental conditions and condition of the material), the object

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in question has the property of not becoming energized (that is, it has high dielectric properties offering a high resistance to the passage of current under the conditions of use).

Operational aids. Devices that assist the operator in the safe operation of the crane by providing information or automatically taking control of a crane function. These include, but are not limited to, the devices listed in §5016 (“listed operational aids”).

Operational controls. Levers, switches, pedals and other devices for controlling equipment operation.

Operator. A person who is operating the equipment.

\*\*\*

Overhead and gantry cranes includes overhead/bridge cranes, semigantry, cantilever gantry, wall cranes, storage bridge cranes, launching gantry cranes, and similar equipment, irrespective of whether it travels on tracks, wheels, or other means.

\*\*\*

Pendants includes both wire and bar types.

(A) Wire type: A fixed length of wire rope with mechanical fittings at both ends for pinning segments of wire rope together.

(B) Bar type: Instead of wire rope, a bar is used. Pendants are typically used in a latticed boom crane system to easily change the length of the boom suspension system without completely changing the rope on the drum when the boom length is increased or decreased.

Personal fall arrest system. A system used to arrest an employee in a fall from a working level. It consists of an anchorage, connectors, a body harness and may include a lanyard, deceleration device, lifeline, or suitable combination of these.

Power lines means electric transmission and distribution lines.

Procedures include, but are not limited to: Instructions, diagrams, recommendations, warnings, specifications, protocols and limitations.

Proximity alarm. A device that provides a warning of proximity to a power line and that has been listed, labeled, or accepted by a Nationally Recognized Testing Laboratory in accordance with 29 CFR 1910.7, or approved in accordance with Section 3206.

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Qualified evaluator (not a third party). A person employed by the signal person's employer who has demonstrated that he/she is competent in accurately assessing whether individuals meet the Qualification Requirements in this Group 13 for a signal person.

Qualified evaluator (third party). An entity that, due to its independence and expertise, has demonstrated that it is competent in accurately assessing whether individuals meet the Qualification Requirements in this Group 13 for a signal person.

Qualified rigger is a rigger who meets the criteria for a qualified person.

\*\*\*

Range control limit device. A device that can be set by an equipment operator to limit movement of the boom or jib tip to a plane or multiple planes.

Range control warning device. A device that can be set by an equipment operator to warn that the boom or jib tip is at a plane or multiple planes.

Rated capacity. The maximum working load permitted by the manufacturer under specified working conditions. Such working conditions typically include a specific combination of factors such as equipment configuration, radii, boom length, and other parameters of use.

Rated capacity indicator: See load moment indicator.

Rated capacity limiter: See load moment limiter.

\*\*\*

Repetitive pickup points refer to, when operating on a short cycle operation, the rope being used on a single layer and being spooled repetitively over a short portion of the drum.

\*\*\*

Running wire rope. A wire rope that moves over sheaves or drums.

Runway. A firm, level surface designed, prepared and designated as a path of travel for the weight and configuration of the crane being used to lift and travel with the crane suspended platform. An existing surface may be used as long as it meets these criteria.

\*\*\*

Sideboom crane. A track-type or wheel-type tractor having a boom mounted on the side of the tractor, used for lifting, lowering or transporting a load suspended on the load hook. The boom or hook can be lifted or lowered in a vertical direction only.

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Special hazard warnings. Warnings of site-specific hazards (for example, proximity of power lines).

Stability (flotation device). The tendency of a barge, pontoons, vessel or other means of flotation to return to an upright position after having been inclined by an external force.

Standard Method. The protocol illustrated in Section 5001, Plate I, for hand signals.

Such as means “such as, but not limited to.”

Superstructure: See “Upperworks.”

\*\*\*

Tagline. A rope (usually fiber) attached to a lifted load for purposes of controlling load spinning and pendular motions or used to stabilize a bucket or magnet during material handling operations.

Tilt up or tilt down operation. Raising/lowering a load from the horizontal to vertical or vertical to horizontal.

\*\*\*

Trim. Angle of inclination about the transverse axis of a barge, pontoons, vessel or other means of flotation.

Trolley (Travel bogie). A truck or carriage supporting the load mounted on an overhead beam, bridge, cableway or track.

\*\*\*

Two-Blocking. A condition in which the lower load block or hook assembly comes into contact with the upper load block or boom point sheave assembly. This binds the system and continued application of power can cause failure of the hoist rope or other component.

Unavailable procedures. Procedures that are no longer available from the manufacturer, or have never been available, from the manufacturer.

Upperstructure: See “Upperworks.”

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Upperworks. The revolving frame of equipment on which the operating machinery (and many cases the engine) are mounted along with the operator's cab. The counterweight is typically supported on the rear of the upperstructure and the boom or other front end attachment is mounted on the front.

Up to means "up to and including."

Wire rope. A flexible rope constructed by laying steel wires into various patterns of multi-wired strands around a core system to produce a helically wound rope.

NOTE: Authority and reference cited: Section 142.3, Labor Code.



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TITLE 8: Division 1, Chapter 4, Subchapter 7. General Industry Safety Orders  
Group 13, Article 93. Boom-Type Mobile Cranes

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Repeal Section 4924 as follows:

~~§4924. Load Safety Devices.~~ *[Ed note: Now covered by 5016(d) and (e)]*

~~(a) All cranes having a maximum rated capacity exceeding one ton shall be equipped with safety devices as provided herein.~~ *[Ed note: Relocated to 5016]*

~~EXCEPTIONS:~~

~~1. Boom-type excavators used in excavation work and all equipment when configured for pile driving or log handling.~~

~~2. Articulating boom cranes are exempt from the provisions of subsection (c).~~ *[Ed note: Relocated to 5016(e)(1)]*

~~3. Digger derrick trucks designed, built and maintained in accordance with ANSI/ASSE A10.31 standards for "Construction and Demolition Operations—Safety Requirements, Definitions and Specifications for Digger Derricks".~~ *[Ed remark: See 5016(a)]*

~~(b) All mobile cranes including truck-mounted tower cranes having either a maximum rated boom length exceeding 200 feet or a maximum rated capacity exceeding 50 tons shall be equipped with a load indicating device or a load moment device, or a device that prevents an overload condition. Only approved devices as defined in the General Industry Safety Orders, Section 3206 shall be used.~~

~~(1) All other mobile cranes manufactured after September 27, 2005, with a maximum rated capacity exceeding 3 tons shall be equipped with a load indicating device, load moment device, or a device that prevents an overload condition.~~

~~EXCEPTION: When installed load indicating devices are not functional, a qualified person shall determine load weights until the device is restored to operation.~~ *[Ed note: Replaced with 5016(e)]*

~~(2) Load indicating devices shall be repaired in accordance with the manufacturer's recommendations.~~ *[Ed note: relocated to 5016(e)(4)(A)]*

~~(c) Mobile cranes shall be provided with a boom angle or radius indicator which clearly shows the boom angle in degrees to the operator at all times.~~

~~EXCEPTION: When a boom angle or radius indicator is inoperative or malfunctioning, a qualified person shall determine the radius or boom angle by measurement until the indicator is restored to operation.~~

~~(1) Boom angle or radius indicators shall be repaired in accordance with the manufacturer's recommendations.~~ *[Ed note: Subsection (c) relocated to 5016(e)(1)]*

~~(d) Anti two-block prevention and warning features.~~

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~~(1) Telescopic boom cranes manufactured after February 28, 1992, shall be equipped with an anti two-block device or two-block damage prevention feature for all points of two-blocking.~~

*[Ed note: relocated to 5016(d)(3)(i)]*

~~(2) Lattice boom cranes manufactured after February 28, 1992, shall be equipped with an anti two-block device or a two-block warning feature, which functions for all points of two-blocking.~~

~~EXCEPTION: The requirements of subsection (d)(2), do not apply to lattice boom cranes when used for dragline, clamshell (grapple), magnet, and drop ball work.~~ *[Ed note: relocated to 5016(d)(3)(ii)]*

~~(3) Articulating boom cranes manufactured after August 30, 2001, equipped with a load hoisting device (winch) shall be equipped with a two-block damage prevention feature.~~ *[Ed note: Relocated to 5016(d)(3)(iii); however, federal effective date is 12/31/99]*

~~(e) Spirit levels, or equivalent, shall be provided to indicate the level of the crane fore and aft and across the width.~~ *[Ed note: Replaced by 5015(a)(1)]*

NOTE: Authority cited: Section 142.3, Labor Code. Reference: Section 142.3, Labor Code.

Amend Section 4925 to read:

§4925. Operator's Cab.

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(c) Exhaust gas discharge shall be away from the normal position of the operator. All exhaust pipes shall be guarded or insulated in areas where contact by employees is possible in the performance of normal duties.

(d) Hydraulic and pneumatic lines shall be protected from damage to the extent feasible.

NOTE: Authority cited: Section 142.3, Labor Code. Reference: Section 142.3, Labor Code.

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Amend Section 4943 as follows:

§4943. ~~Permanently Mounted Floating Cranes/Derricks and Land Cranes/Derricks on Barges.~~

*[Ed note: replace existing section 4943 with new federal provisions from 1926.1437]*

~~(a) When cranes and derricks are permanently installed on a barge, the capacity and limitations of use shall be as specified by the certified agent.~~ This section contains supplemental requirements for floating cranes/derricks and land cranes/derricks on barges, pontoons, vessels or other means of flotation (i.e., vessel/flotation device). This section applies to floating cranes/derricks and land cranes/derricks on barges, pontoons, vessels or other means of flotation,

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unless specified otherwise. The requirements of this section do not apply when using jacked barges when the jacks are deployed to the river, lake, or sea bed and the barge is fully supported by the jacks.

(b) ~~Floating cranes and floating derricks in use shall meet the applicable requirements for design, construction, installation, testing, maintenance and operation as prescribed by the certified agent.~~ General requirements. The requirements in subsections (c) through (h) apply to both floating cranes/derricks and land cranes/derricks on barges, pontoons, vessels or other means of flotation.

(c) Work area control.

(1) The employer shall either:

(A) Erect and maintain control lines, warning lines, railings or similar barriers to mark the boundaries of the hazard areas; or

(B) Clearly mark the hazard areas by a combination of warning signs (such as, “Danger – Swing/Crush Zone”) and high visibility markings on the equipment that identify the hazard areas. In addition, the employer shall train each employee to understand what these markings signify.

(d) Additional safety devices. In addition to the safety devices listed in §5015, the following safety devices are required:

(1) Barge, pontoon, vessel or other means of flotation list and trim device. The safety device shall be located in the cab or, when there is no cab, at the operator’s station.

(2) Positive equipment house lock.

(3) Wind speed and direction indicator. A competent person shall determine if wind is a factor that needs to be considered; if wind needs to be considered, a wind speed and direction indicator shall be used.

(e) Operational Aids. Section 5016(e)(4) (Load weighing and similar devices) does not apply to dragline, clamshell (grapple), magnet, drop ball, container handling, concrete bucket, and pile driving work performed under this section.

(f) Accessibility of procedures applicable to equipment operation. If the crane/derrick has a cab, the requirements of §5008.1(b) and (c) apply. If the crane/derrick does not have a cab, the employer shall ensure that:

(1) Rated capacities (load charts) are posted at the operator’s station. If the operator’s station is moveable (such as with pendant-controlled equipment), the load charts are posted on the equipment.

(2) Procedures applicable to the operation of the equipment (other than load charts), recommended operating speeds, special hazard warnings, instructions and operators manual, shall be readily available on board the vessel/flotation device.

(g) Inspections. In addition to meeting the requirements of Article 100 for inspecting the crane/derrick, the employer shall inspect the barge, pontoons, vessel or other means of flotation used to support a floating crane/derrick or land crane/derrick, and ensure that:

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(1) Shift. For each shift inspection, the means used to secure/attach the equipment to the vessel/flotation device is in proper condition, including wear, corrosion, loose or missing fasteners, defective welds, and (when applicable) insufficient tension.

(2) Monthly. For each monthly inspection:

(A) The means used to secure/attach the equipment to the vessel/flotation device is in proper condition, including inspection for wear, corrosion, and, when applicable, insufficient tension.

(B) The vessel/flotation device is not taking on water.

(C) The deckload is properly secured.

(D) The vessel/flotation device is watertight based on the condition of the chain lockers, storage, fuel compartments, and hatches.

(E) The firefighting and lifesaving equipment is in place and functional.

(3) The shift and monthly inspections are conducted by a qualified person, and:

(A) If any deficiency is identified, an immediate determination is made by a qualified person whether the deficiency constitutes a hazard.

(B) If the deficiency is determined to constitute a hazard, the vessel/flotation device is removed from service until the deficiency has been corrected.

(4) Annual: external vessel/flotation device inspection. For each annual inspection:

(A) The external portion of the barge, pontoons, vessel or other means of flotation used is inspected annually by a certificating agency or qualified person who has expertise with respect to vessels/flotation devices and that the inspection includes the following items:

1. The items identified in subsections (g)(1) (Shift) and (g)(2) (Monthly).

2. Cleats, bitts, chocks, fenders, capstans, ladders, and stanchions, for significant corrosion, wear, deterioration, or deformation that could impair the function of these items.

3. External evidence of leaks and structural damage; evidence of leaks and damage below the waterline may be determined through internal inspection of the vessel/flotation device.

4. Four-corner draft readings.

5. Firefighting equipment for serviceability.

(B) Rescue skiffs, lifelines, work vests, life preservers and ring buoys are inspected for proper condition.

(C) If any deficiency is identified, an immediate determination is made by the certificating agency or qualified person whether the deficiency constitutes a hazard or, though not yet a hazard, needs to be monitored in the monthly inspections.

1. If the certificating agency or qualified person determines that the deficiency constitutes a hazard, the vessel/flotation device is removed from service until it has been corrected. See requirements in §5008.1(f).

2. If the certificating agency or qualified person determines that, though not presently a hazard, the deficiency needs to be monitored, the deficiency is checked in the monthly inspections.

(5) Four-year: internal vessel/flotation device inspection. For each four-year inspection:

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(A) A marine engineer, marine architect, licensed surveyor, or other qualified person who has expertise with respect to vessels/flotation devices surveys the internal portion of the barge, pontoons, vessel, or other means of flotation.

(B) If the surveyor identifies a deficiency, an immediate determination is made by the surveyor as to whether the deficiency constitutes a hazard or, though not yet a hazard, needs to be monitored in the monthly or annual inspections, as appropriate.

1. If the surveyor determines that the deficiency constitutes a hazard, the vessel/flotation device is removed from service until it has been corrected.

2. If the surveyor determines that, though not presently a hazard, the deficiency needs to be monitored, the deficiency is checked in the monthly or annual inspections, as appropriate.

(6) Documentation. The monthly and annual inspections required in subsections (g)(2) and (g)(4) are documented in accordance with Sections 5031.1 and 5031.2, respectively, and that the four-year inspection required in subsection (g)(5) is documented in accordance with Section 5031.2, except that the documentation for that inspection shall be retained for a minimum of 4 years. All such documents shall be made available, during the applicable document retention period, to all persons who conduct inspections in accordance with Article 100.

(h) Manufacturer's specifications and limitations.

(1) The employer shall ensure that the barge, pontoons, vessel, or other means of flotation is/are capable of withstanding imposed environmental, operational and in-transit loads when used in accordance with the manufacturer's specifications and limitations.

(2) The employer shall ensure that the manufacturer's specifications and limitations with respect to environmental, operational, and in-transit loads for a barge, pontoon, vessel, or other means of flotation are not exceeded or violated.

(3) When the manufacturer's specifications and limitations are unavailable, the employer shall ensure that the specifications and limitations established by a qualified person with respect to environmental, operational and in-transit loads for the barge, pontoons, vessel, or other means of flotation are not exceeded or violated.

(i) Floating cranes/derricks. For equipment designed by the manufacturer (or employer) for marine use by permanent attachment to barges, pontoons, vessels or other means of flotation:

(1) Load charts.

(A) The employer shall not exceed the manufacturer load charts applicable to operations on water. When using these charts, the employer shall comply with all parameters and limitations (such as dynamic and environmental parameters) applicable to the use of the charts.

(B) The employer shall ensure that load charts take into consideration a minimum wind speed of 40 miles per hour.

(2) The employer shall ensure that the requirements for maximum allowable list and maximum allowable trim as specified in Table M1 of this section are met.

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**TABLE M1**

<u>Rated Capacity</u>	<u>Maximum Allowable List (degrees)</u>	<u>Maximum Allowable Trim (degrees)</u>
<u>Equipment designed for marine use by permanent attachment (other than derricks):</u>		
<u>25 tons or less</u>	<u>5</u>	<u>5</u>
<u>Over 25 tons</u>	<u>7</u>	<u>7</u>
<u>Derricks designed for marine use by permanent attachment:</u>		
<u>Any rated capacity</u>	<u>10</u>	<u>10</u>

(3) The employer shall ensure that the equipment is stable under the conditions specified in Tables M2 and M3 of this section. (NOTE: Freeboard is the vertical distance between the water line and the main deck of the vessel.)

**TABLE M2**

<u>Operated at</u>	<u>Wind speed (mph)</u>	<u>Minimum freeboard (ft)</u>
<u>Rated capacity</u>	<u>60</u>	<u>2</u>
<u>Rated capacity plus 25%</u>	<u>60</u>	<u>1</u>
<u>High boom, no load</u>	<u>60</u>	<u>2</u>

**TABLE M3**

<u>Operated at</u>	<u>Wind speed (mph)</u>
<u>For backward stability of the boom: High boom, no load, full back list (least stable condition).</u>	<u>90</u>

(4) If the equipment is employer-made, it shall not be used unless the employer has documents demonstrating that the load charts and applicable parameters for use meet the requirements of subsections (i)(1) through (3). Such documents shall be signed by a registered professional engineer who is a qualified person with respect to the design of this type of equipment (including the means of flotation).

(5) The employer shall ensure that the barge, pontoons, vessel or other means of flotation used:

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(A) Are structurally sufficient to withstand the static and dynamic loads of the crane/derrick when operating at the crane/derrick's maximum rated capacity with all planned and actual deck loads and ballasted compartments.

(B) Have a subdivided hull with one or more longitudinal watertight bulkheads for reducing the free-surface effect.

(C) Have access to void compartments to allow for inspection and pumping.

(j) Land cranes/derricks. For land cranes/derricks used on barges, pontoons, vessels or other means of flotation, the employer shall ensure that:

(1) The rated capacity of the equipment (including but not limited to modification of load charts) applicable for use on land is reduced to:

(A) Account for increased loading from list, trim, wave action, and wind.

(B) Be applicable to a specified location(s) on the specific barge, pontoons, vessel or other means of flotation that will be used, under the environmental conditions expected and encountered.

(C) The conditions required in subsections (j)(3) and (j)(4) are met.

(2) The rated capacity modification required in subsection (j)(1) is performed by the equipment manufacturer, or a qualified person who has expertise with respect to both land crane/derrick capacity and the stability of vessels/flotation devices.

(3) For list and trim.

(A) The maximum allowable list and the maximum allowable trim for the barge, pontoon, vessel or other means of flotation shall not exceed the amount necessary to ensure that the conditions in subsection (j)(4) are met. In addition, the maximum allowable list and the maximum allowable trim does not exceed the least of the following: 5 degrees, the amount specified by the crane/derrick manufacturer, or, when, an amount is not so specified, the amount specified by the qualified person.

(B) The maximum allowable list and the maximum allowable trim for the land crane/derrick does not exceed the amount specified by the crane/derrick manufacturer, or, when, an amount is not so specified, the amount specified by the qualified person.

(4) For the following conditions:

(A) All deck surfaces of the barge, pontoons, vessel or other means of flotation used are above water.

(B) The entire bottom area of the barge, pontoons, vessel or other means of flotation used is submerged.

(5) Physical attachment, corraling, rails system and centerline cable system meet the requirements in Option (1), Option (2), Option (3), or Option (4) of this subsection, and that whichever option is used also meets the requirements of subsection (j)(5)(E) of this section.

(A) Option (1) – Physical attachment. The crane/derrick is physically attached to the barge, pontoons, vessel or other means of flotation. Methods of physical attachment include crossed-cable systems attached to the crane/derrick and vessel/flotation device, bolting or welding the

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crane/derrick to the vessel/flotation device, strapping the crane/derrick to the vessel/flotation device with chains, or other methods of physical attachment.

(B) Option (2) – Corralling. The crane/derrick is prevented from shifting by installing barricade restraints (i.e., a corraling system). Employers shall ensure that corraling systems do not allow the equipment to shift by any amount of shifting in any direction.

(C) Option (3) – Rails. The crane/derrick shall be prevented from shifting by being mounted on a rail system. Employers shall ensure that rail clamps and rail stops are used unless the system is designed to prevent movement during operation by other means.

(D) Option (4) – Centerline cable system. The crane/derrick is prevented from shifting by being mounted to a wire rope system. The employer shall ensure that the wire rope system meets the following requirements:

1. The wire rope and attachments are of sufficient size and strength to support the side load of crane/derrick.

2. The wire rope is attached physically to the vessel/flotation device.

3. The wire rope is attached to the crane/derrick by appropriate attachment methods (such as shackles or sheaves) on the undercarriage, and that the method used will allow the crew to secure the crane/derrick from movement during operation and to move the crane/derrick longitudinally along the vessel/flotation device for repositioning.

4. Means are installed to prevent the crane/derrick from passing the forward or aft end of the wire rope attachments.

5. The crane/derrick is secured from movement during operation.

(E) The systems/means used to comply with Option (1), Option (2), Option (3), or Option (4) of this section are designed by a marine engineer, registered professional engineer familiar with floating crane/derrick design, or qualified person familiar with floating crane/derrick design.

(6) EXCEPTION. For mobile auxiliary cranes used on the deck of a floating crane/derrick, the requirement specified by subsection (j)(5) to use Option (1), Option (2), Option (3), or Option (4) does not apply when the employer demonstrates implementation of a plan and procedures that meet the following requirements:

(A) A marine engineer or registered professional engineer familiar with floating crane/derrick design develops and signs a written plan for the use of the mobile auxiliary crane.

(B) The plan is designed so that the applicable requirements of this section are met despite the position, travel, operation, and lack of physical attachment (or corraling, use of rails or cable system) of the mobile auxiliary crane.

(C) The plan specifies the areas of the deck where the mobile auxiliary crane is permitted to be positioned, travel, and operate, and the parameters and limitations of such movements and operation.

(D) The deck is marked to identify the permitted areas for positioning, travel, and operation.

(E) The plan specifies the dynamic and environmental conditions that shall be present for use of the plan.



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(F) If the dynamic and environmental conditions in subsection (j)(6)(E) are exceeded, the mobile auxiliary crane is attached physically or corralled in accordance with Option (1), Option (2) or Option (4) of subsection (j)(5).

(7) The barge, pontoons, vessel or other means of flotation used:

(A) Are structurally sufficient to withstand the static and dynamic loads of the crane/derrick when operating at the crane/derrick's maximum rated capacity with all anticipated deck loads and ballasted compartments.

(B) Have a subdivided hull with one or more longitudinal watertight bulkheads for reducing the free surface effect.

(C) Have access to void compartments to allow for inspection and pumping.

NOTE: Authority cited: Section 142.3, Labor Code. Reference: Section 142.3, Labor Code.

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Add new Section 4944.1 as follows:

§4944.1. Dedicated Pile Drivers.

(a) The provisions of Group 13 apply to dedicated pile drivers, except as specified in this section.

(b) Section 5016(d)(3) (Anti two-blocking device) does not apply.

(c) Section 5016(e)(4) (Load weighing and similar devices) applies only to dedicated pile drivers manufactured after [Effective Date plus one year].

NOTE: Authority cited: Section 142.3, Labor Code. Reference: Section 142.3, Labor Code.

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TITLE 8: Division 1, Chapter 4, Subchapter 7. General Industry Safety Orders  
Group 13, Article 95. Derricks

Amend Section 4960 to read:

§4960. Construction.

- (a) Derricks shall be guyed and anchored so as to prevent tipping or collapsing.
- (b) Reinforcing steel shall not be used for guy line anchors.
- (c) Dogs, pawls, or other positive holding mechanism on the hoist shall be engaged. When taken out of service for 30 days or more, the boom shall be secured by one of the following methods:  
~~not in use, the derrick boom shall:~~
  - (1) Be laid down;
  - (2) Be secured to a stationary member, as nearly under the head as possible, by attachment of a sling to the load block; or
  - (3) For guy derricks ~~Be~~ hoisted to a vertical position and secured to the mast.
  - (4) For stiffleg derricks, secured against the stiffleg.
- (d) The process of jumping the derrick shall be supervised by the A/D director.
- (e) Derrick operations shall be supervised by a competent person.
- (f) Guy derricks shall not be used unless the employer has the following guy information from the manufacturer or a qualified person, when not available from the manufacturer:
  - (1) The number of guys.
  - (2) The spacing around the mast.
  - (3) The size, grade, and construction of rope to be used for each guy.
- (g) For guy derricks manufactured after December 18, 1970, in addition to the information required in subsection (f), the employer shall have the following guy information from the manufacturer or a qualified person, when not available from the manufacturer:
  - (1) The amount of initial sag or tension.
  - (2) The amount of tension in guy line rope at anchor.
- (h) The mast base shall permit the mast to rotate freely with allowance for slight tilting of the mast caused by guy slack.
- (i) The mast cap shall:
  - (1) Permit the mast to rotate freely.
  - (2) Withstand tilting and cramping caused by the guy loads.
  - (3) Be secured to the mast to prevent disengagement during erection.
  - (4) Be provided with means for attaching guy ropes.
- (j) Derricks manufactured more than one year after [Effective Date] with a maximum rated capacity over 6,000 pounds shall have at least one of the following: load weighing device, load moment indicator, rated capacity indicator, or rated capacity limiter.

NOTE: Authority cited: Section 142.3, Labor Code. Reference: Section 142.3, Labor Code.

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Add new Section 4960.1 as follows:

§4960.1 Inspections. In addition to the requirements in Article 100, the following additional items shall be included in the inspections:

(a) Annual.

(1) Gudgeon pin for cracks, wear, and distortion.

(2) Foundation supports for continued ability to sustain the imposed Loads.

(b) Inspections required by subsection (a) shall be performed by a licensed crane certifying agency.

NOTE: Authority cited: Section 142.3, Labor Code. Reference: Section 142.3, Labor Code.

Amend Section 4961 to read:

§4961. Rated Load Marking.

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(b) For non-permanent installations, capacity charts shall be prepared for the particular installation based on information provided by the certified agent. The capacity charts shall be located at the derrick and shall be readily available to personnel responsible for the operation of the equipment.

NOTE: Authority cited: Section 142.3, Labor Code. Reference: Section 142.3, Labor Code.

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TITLE 8: Division 1, Chapter 4, Subchapter 7. General Industry Safety Orders  
Group 13, Article 96. Tower Cranes

Amend Section 4965 to read:

§4965. General.

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(k) Proper operation required. Operations shall not begin unless the devices listed in this Article are in proper working order. If a device stops working properly during operations, the operator shall safely stop operations. The equipment shall be taken out of service, and operations shall not resume until the device is again working properly. See §5008.1(f). Alternative measures are not permitted to be used.

NOTE: Authority cited: Section 142.3, Labor Code. Reference: Section 142.3, Labor Code.

Amend Section 4966 as follows:

§4966. Erection, Dismantling and Operation.

(a) Erection and Dismantling.

(1) The erection, climbing (up and down) and dismantling of a fixed tower crane shall comply with the requirements of Title 8, Sections 341.1(b)(2), 4992, 4992.1 and 4992.2.

(A) ~~(2)~~ Guys, braces and other supports shall be employed as necessary to prevent damage or collapse of the equipment during the erection and dismantling procedures.

(2) Dangerous areas (self-erecting tower cranes). In addition to the requirements in §4992.1(e), for self-erecting tower cranes, the following applies: Employees shall not be in or under the tower, jib, or rotating portion of the crane during erecting, climbing and dismantling operations until the crane is secured in a locked position and the competent person in charge indicates it is safe to enter this area, unless the manufacturer's instructions direct otherwise and only the necessary personnel are permitted in this area.

(3) ~~(A)~~ Employees engaged in the erection and/or dismantling of tower cranes and the inspection, maintenance or repair related to such erection and/or dismantling, when working at elevations 15 feet or greater over ground or other surfaces shall be required to use fall protection as specified in Article 24 of the Construction Safety Orders, and Section 5010 of these Orders.

(b) The unbraced, free standing portion of the mast between the boom and the top support position shall be limited in height to the distance recommended by the certified agent.

(c) Foundations and structural supports. Tower crane foundations and structural supports (including both the portions of the structure used for support and the means of attachment) shall be designed by the manufacturer or a California registered professional engineer. ~~When the~~

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~~certified agent requires the mast to be secured in the shaftway of a structure, the structural members to which it is secured shall be adequate to safely sustain all anticipated loads including vibration.~~

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(i) Plumb tolerance. Towers shall be erected plumb to the manufacturer's tolerance and verified by a qualified person. Where the manufacturer does not specify plumb tolerance, the crane tower shall be plumb to a tolerance of at least 1:500 (approximately 1 inch in 40 feet).

(j) Multiple tower crane jobsites. On jobsites where more than one tower crane is installed, the cranes shall be located such that no crane can come in contact with the structure of another crane. Cranes are permitted to pass over one another.

(k) Climbing procedures. Prior to, and during, all climbing procedures (including inside climbing and top climbing), the employer shall:

(1) Comply with all manufacturer prohibitions.

(2) Have a California registered professional engineer verify that the host structure is strong enough to sustain the forces imposed through the braces, brace anchorages and supporting floors.

(l) Counterweight/ballast.

(1) Equipment shall not be erected, dismantled or operated without the amount and position of counterweight and/or ballast in place as specified by the manufacturer or a California registered professional engineer familiar with the equipment.

(2) The maximum counterweight and/or ballast specified by the manufacturer or California registered professional engineer familiar with the equipment shall not be exceeded.

(m) Signs. The size and location of signs installed on tower cranes shall be in accordance with manufacturer specifications. Where these are unavailable, a California registered professional engineer familiar with the type of equipment involved shall approve in writing the size and location of any signs.

(n) Addressing specific hazards. The requirements in §4992.1(h)(1) through (9) apply. In addition, the A/D director shall address the following:

(1) Foundations and structural supports. The A/D director shall determine that tower crane foundations and structural supports are installed in accordance with their design.

(2) Loss of backward stability. Backward stability before swinging self erecting cranes or cranes on traveling or static undercarriages.

(3) Wind speed. Wind shall not exceed the speed recommended by the manufacturer or, where manufacturer does not specify this information, the speed determined by a qualified person.

NOTE: Authority cited: Section 142.3, Labor Code. Reference: Section 142.3, Labor Code.

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Amend Section 4968 to read:

§4968. Safety Devices.

All tower cranes shall have the following safety devices:

(a) Visual warning devices:

(1) A warning light which shall be activated at a percentage of the rated load, not to exceed 95 percent of the rated load, or

(2) Electronic instrumentation provided by the certified agent that gives a continuous direct reading of the load weight and the trolley radius.

(b) An audible signal that operates at a percentage of the rated load, not to exceed 100 percent of the rated load.

(c) The visual warning light, and audible signal required by subsections (a)(1) and (b) shall be set to avoid simultaneous activation, and operate with a difference of at least 5 percent of the rated load to ensure independent warnings.

(d) An automatic stop that operates at a percentage of the rated load, not to exceed 105 percent of the rated load.

(e) When the crane manufacturer specifies lower activation points for safety devices than required by subsections (a)(1), (b) and (d), the manufacturer's specifications shall be followed.

(f) Limit devices to:

(1) Provide deceleration before the top position of the hook is reached.

(2) Limit the trolley traveling both in and out.

(g) Constant pressure control devices which automatically return to neutral or the "off" position when released by the operator.

(h) Boom stops on luffing boom type tower cranes.

(i) Jib stops on luffing boom type tower cranes if equipped with a jib attachment.

(j) Travel rail end stops at both ends of travel rail.

(k) Travel rail clamps on all travel bogies.

(l) Integrally mounted check valves on all load supporting hydraulic cylinders.

(m) Hydraulic system pressure limiting device.

(n) The following brakes, which shall automatically set in the event of pressure loss or power failure, are required:

(1) A hoist brake on all hoists.

(2) Swing brake.

(3) Trolley brake.

(o) Rail travel brake.

(p) Deadman control or forced neutral return control (hand) levers.

(q) Emergency stop switch at the operator's station.

(r) Trolley end stops shall be provided at both ends of travel of the trolley.

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(s) Wind speed indicator. A device shall be provided to display the wind speed and shall be mounted above the upper rotating structure on tower cranes. On self erecting cranes, it shall be mounted at or above the jib level.

Temporary alternative measures: Use of wind speed information from a properly functioning indicating device on another tower crane on the same site, or a qualified person estimates the wind speed.

NOTE: Authority cited: Section 142.3, Labor Code. Reference: Section 142.3, Labor Code.

Add new Section 4968.1 as follows:

4968.1. Operational Aids.

(a) The devices listed in this section (“operational aids”) are required on all tower cranes covered by Group 13, unless otherwise specified.

(b) Operations shall not begin unless the operational aids are in proper working order.

EXCEPTION: More protective alternative measures specified by the tower crane manufacturer, if any, may be followed. See §5008.1(i) for additional requirements.

(c) If an operational aid stops working properly during operations, the operator shall safely stop operations until the device is again working properly.

(d) Category I operational aids. Operational aids listed in this subsection shall be operational prior to and during operation at all times.

(1) Trolley travel limiting device. The travel of the trolley shall be restricted at both ends of the jib by a trolley travel limiting device to prevent the trolley from running into the trolley end stops.

(2) Boom hoist limiting device. The range of the boom shall be limited at the minimum and maximum radius.

(3) Anti two-blocking device. The tower crane shall be equipped with a device which automatically prevents damage from contact between the load block, overhaul ball, or similar component, and the boom tip (or fixed upper block or similar component). The device(s) shall prevent such damage at all points where two-blocking could occur.

(4) Hoist drum lower limiting device. Tower cranes manufactured after November 8, 2011 shall be equipped with a device that prevents the last 2 wraps of hoist cable from being spooled off the drum.

(5) Load moment limiting device. The tower crane shall have a device that prevents moment overloading.

(6) Hoist line pull limiting device. The capacity of the hoist shall be limited to prevent overloading, including each individual gear ratio if equipped with a multiple speed hoist transmission.

(7) Rail travel limiting device. The travel distance in each direction shall be limited to prevent the travel bogies from running into the end stops or buffers.

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(8) Boom hoist drum positive locking device and control. The boom hoist drum shall be equipped with a control that will enable the operator to positively lock the boom hoist drum from the cab.

(9) Boom angle or hook radius indicator.

(A) Luffing boom tower cranes shall have a boom angle indicator readable from the operator's station.

(B) Hammerhead tower cranes manufactured after November 8, 2011 shall have a hook radius indicator readable from the operator's station.

(10) Trolley travel deceleration device. The trolley speed shall be automatically reduced prior to the trolley reaching the end limit in both directions.

(11) Boom hoist deceleration device. The boom speed shall be automatically reduced prior to the boom reaching the minimum or maximum radius limit.

(12) Load hoist deceleration device.

The load speed shall be automatically reduced prior to the hoist reaching the upper limit.

(13) Wind speed indicator. A device shall be provided to display the wind speed and shall be mounted above the upper rotating structure on tower cranes. On self erecting cranes, it shall be mounted at or above the jib level.

(14) Load indicating device. Cranes manufactured after November 8, 2011 shall have a device that displays the magnitude of the load on the hook. Displays that are part of load moment limiting devices that display the load on the hook meet this requirement.

(e) [Not used]

(f) Inspections.

(1) Article 100 (Inspections and Maintenance) applies to tower cranes, except that the term "assembly" is replaced by "erection." Section 5036 (Wire Rope Inspections) applies to tower cranes.

(2) Pre-erection inspection. Before each crane component is erected, it shall be inspected by a qualified person for damage or excessive wear.

(A) The qualified person shall pay particular attention to components that will be difficult to inspect thoroughly during shift inspections.

(B) If the qualified person determines that a component is damaged or worn to the extent that it would create a safety hazard if used on the crane, that component shall not be erected on the crane unless it is repaired and, upon reinspection by the qualified person, found to no longer create a safety hazard.

(C) If the qualified person determines that, though not presently a safety hazard, the component needs to be monitored, the employer shall ensure that the component is checked in the monthly inspections. Any such determination shall be documented, and the documentation shall be available to any individual who conducts a monthly inspection.

(3) Post-erection inspection. In addition to the requirements in §5031.6, the following requirements shall be met:



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(A) A load test using certified weights, or scaled weights using a certified scale with a current certificate of calibration, shall be conducted after each erection.

(B) The load test shall be conducted in accordance with the manufacturer's instructions when available. Where these instructions are unavailable, the test shall be conducted in accordance with written load test procedures developed by a certifying agency.

(4) Monthly. The following additional items shall be included:

(A) Tower (mast) bolts and other structural bolts (for loose or dislodged condition) from the base of the tower crane up or, if the crane is tied to or braced by the structure, those above the upper-most brace support.

(B) The upper-most tie-in, braces, floor supports and floor wedges where the tower crane is supported by the structure, for loose or dislodged components.

(5) Annual. In addition to the items that must be inspected under §5031.2, all turntable and tower bolts shall be inspected for proper condition and torque.

NOTE: Authority cited: Section 142.3, Labor Code. Reference: Section 142.3, Labor Code.

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TITLE 8: Division 1, Chapter 4, Subchapter 7. General Industry Safety Orders  
Group 13, Article 98. Operating Rules

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Amend Section 4991 as follows:

§4991. Travel.

(a) The travel of cranes or boom-type excavators shall be controlled so as to avoid collision with persons, material, and equipment. The cabs of units (of the revolving type) traveling under their own power shall be turned so as to provide the least obstruction to the operator's vision in the direction of travel, unless receiving signals from someone with an unobstructed view.

(b) In transit, the following additional precautions for mobile cranes shall be exercised:

(1) The boom shall be carried in line with the direction of motion and the superstructure shall be secured against rotation, except when negotiating turns when there is an operator in the cab, or when the boom is supported on a dolly.

(2) The empty hook, headache ball, or block shall be lashed or otherwise restrained so that it cannot swing freely.

(c) Traveling with a load is prohibited if the practice is prohibited by the manufacturer.

(d) Where traveling with a load, the employer shall ensure that:

(1) A competent person supervises the operation, determines if it is necessary to reduce rated capacity, and makes determinations regarding load position, boom location, ground support, travel route, overhead obstructions, and speed of movement necessary to ensure safety.

(2) For equipment with tires, tire pressure specified by the manufacturer is maintained.

NOTE: Authority cited: Section 142.3, Labor Code. Reference: Section 142.3, Labor Code.

Add new section 4991.1 as follows:

§4991.1. Ground Conditions.

(a) Definitions.

(1) "Ground conditions" means the ability of the ground to support the equipment (including slope, compaction, and firmness).

(2) "Supporting materials" means blocking, mats, cribbing, marsh buggies (in marshes/wetlands), or similar supporting materials or devices.

(b) The equipment must not be assembled or used unless ground conditions are firm, drained, and graded to a sufficient extent so that, in conjunction (if necessary) with the use of supporting materials, the equipment manufacturer's specifications for adequate support and degree of level of the equipment are met. The requirement for the ground to be drained does not apply to marshes/wetlands.

(c) The controlling entity shall:

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(1) Ensure that ground preparations necessary to meet the requirements in subsection (b) are provided.

(2) Inform the user of the equipment and the operator of the location of hazards beneath the equipment set-up area (such as voids, tanks, utilities) if those hazards are identified in documents (such as site drawings, as-built drawings, and soil analyses) that are in the possession of the controlling entity (whether at the site or off-site) or the hazards are otherwise known to that controlling entity.

(d) If there is no controlling entity for the project, the requirement in subsection (c)(1) shall be met by the employer that has authority at the site to make or arrange for ground preparations needed to meet subsection (b).

(e) If the A/D director or the operator determines that ground conditions do not meet the requirements in subsection (b), that person's employer shall have a discussion with the controlling entity regarding the ground preparations that are needed so that, with the use of suitable supporting materials/devices (if necessary), the requirements in subsection (b) can be met.

(f) This section does not apply to cranes designed for use on railroad tracks when used on railroad tracks that are part of the general railroad system of transportation that is regulated pursuant to the Federal Railroad Administration under 49 CFR part 213 and that comply with applicable Federal Railroad Administration requirements.

NOTE: Authority cited: Section 142.3, Labor Code. Reference: Section 142.3, Labor Code.

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Add new Section 4991.2 as follows:

§4991.2. Power Line Safety—While Traveling Under or Near Power Lines with No Load.

(a) This section establishes procedures and criteria that shall be met for equipment traveling under or near a power line on a construction site with no load. Equipment traveling on a construction site with a load is governed by Sections 5003.1, 5003.2 or 5003.3, whichever is appropriate, and §4991.

(1) The provisions of Electrical Safety Orders, Group 2, Article 37, shall also apply to any work in proximity to overhead power lines where more protective.

(b) The employer shall ensure that:

(1) The boom/mast and boom/mast support system are lowered sufficiently to meet the requirements of this section.

(2) The clearances specified in Table T of this section are maintained.

(3) The effects of speed and terrain on equipment movement (including movement of the boom/ mast) are considered so that those effects do not cause the minimum clearance distances specified in Table T of this section to be breached.

(4) Dedicated spotter. If any part of the equipment while traveling will get closer than 20 feet to the power line, the employer shall ensure that a dedicated spotter who is in continuous contact with the driver/operator is used. The dedicated spotter shall:

(A) Be positioned to effectively gauge the clearance distance.

(B) Where necessary, use equipment that enables the dedicated spotter to communicate directly with the operator.

(C) Give timely information to the operator so that the required clearance distance can be maintained.

(5) Additional precautions for traveling in poor visibility. When traveling at night, or in conditions of poor visibility, in addition to the measures specified in subsections (b)(1) through (4), the employer shall ensure that:

(A) The power lines are illuminated or another means of identifying the location of the lines is used.

(B) A safe path of travel is identified and used.

TABLE T—MINIMUM CLEARANCE DISTANCES WHILE TRAVELING WITH NO LOAD

<u>Voltage (nominal, kV, alternating current)</u>	<u>While traveling—minimum clearance distance (feet)</u>
<u>up to 0.60</u>	<u>4</u>
<u>over .60 to 50</u>	<u>6</u>
<u>over 50 to 345</u>	<u>10</u>
<u>over 345 to 750</u>	<u>16</u>
<u>Over 750 to 1,000</u>	<u>20</u>
<u>Over 1,000</u>	<u>(as established by the utility owner/operator or registered professional engineer who is a qualified person with respect to electrical power transmission and distribution).</u>

NOTE: Authority cited: Section 142.3, Labor Code. Reference: Section 142.3, Labor Code.

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Amend Section 4992 as follows:

§4992. ~~Booms.~~ Assembly/Disassembly – Selection of Manufacturer or Employer Procedures.  
~~Booms which are being assembled or disassembled on the ground shall be securely blocked or secured to prevent dropping of the boom and boom sections.~~

When assembling or disassembling equipment (or attachments), the employer shall comply with all applicable manufacturer procedures and prohibitions applicable to assembly and disassembly.

NOTE: The employer must follow manufacturer procedures when an employer uses synthetic slings during assembly or disassembly rigging. [See §4992.1(r)].

NOTE: Authority cited: Section 142.3, Labor Code. Reference: Section 142.3, Labor Code.

Add new Section 4992.1 as follows:

§4992.1. Assembly/Disassembly – General Requirements (applies to all assembly and disassembly operations).

(a) Supervision—competent-qualified person.

(1) Assembly/disassembly shall be directed by a person who meets the criteria for both a competent person and a qualified person, or by a competent person who is assisted by one or more qualified persons (“A/D director”).

(2) Where the assembly/disassembly is being performed by only one person, that person shall meet the criteria for both a competent person and a qualified person. For purposes of this standard, that person is considered the A/D director.

(b) Knowledge of procedures. The A/D director shall understand the applicable assembly/disassembly procedures.

(c) Review of procedures. The A/D director shall review the applicable assembly/disassembly procedures immediately prior to the commencement of assembly/disassembly unless the A/D director understands the procedures and has applied them to the same type and configuration of equipment (including accessories, if any).

(d) Crew instructions.

(1) Before commencing assembly/disassembly operations, the A/D director shall ensure that the crew members understand all of the following:

(A) Their tasks.

(B) The hazards associated with their tasks.

(C) The hazardous positions/locations that they need to avoid.

(2) During assembly/disassembly operations, before a crew member takes on a different task, or when adding new personnel during the operations, the requirements in subsections (d)(1)(i) through (d)(1)(C) of this section shall be met.

(e) Protecting assembly/disassembly crew members out of operator view.

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(1) Before a crew member goes to a location that is out of view of the operator and is either in, on, or under the equipment, or near the equipment (or load) where the crew member could be injured by movement of the equipment (or load), the crew member shall inform the operator that he/she is going to that location.

(2) Where the operator knows that a crew member went to a location covered by subsection (e)(1), the operator shall not move any part of the equipment (or load) until the operator is informed in accordance with a prearranged system of communication that the crew member is in a safe position.

(f) Working under the boom, jib or other components.

(1) When pins (or similar devices) are being removed, employees shall not be under the boom, jib, or other components.

(g) Capacity limits. During all phases of assembly/disassembly, rated capacity limits for loads imposed on the equipment, equipment components (including rigging), lifting lugs and equipment accessories, shall not be exceeded for the equipment being assembled/disassembled.

(h) Addressing specific hazards. The A/D director supervising the assembly/disassembly operation shall address the hazards associated with the operation, which include but are not limited to:

(1) Site and ground bearing conditions. Site and ground conditions shall be adequate for safe assembly/disassembly operations and to support the equipment during assembly/disassembly (see §4991.1 for ground condition requirements).

(2) Blocking material. The size, amount, condition and method of stacking the blocking shall be sufficient to sustain the loads and maintain stability.

(3) Proper location of blocking. When used to support lattice booms or components, blocking shall be appropriately placed to:

(A) Protect the structural integrity of the equipment, and

(B) Prevent dangerous movement and collapse.

(4) Verifying assist crane loads. When using an assist crane, the loads that will be imposed on the assist crane at each phase of assembly/disassembly shall be verified in accordance with §4999(b) before assembly/disassembly begins.

(5) Boom and jib pick points. The point(s) of attachment of rigging to a boom (or boom sections or jib or jib sections) shall be suitable for preventing structural damage and facilitating safe handling of these components.

(6) Center of gravity.

(A) The center of gravity of the load shall be identified if that is necessary for the method used for maintaining stability.

(B) Where there is insufficient information to accurately identify the center of gravity, measures designed to prevent unintended dangerous movement resulting from an inaccurate identification of the center of gravity shall be used.

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(7) Stability upon pin removal. The boom sections, boom suspension systems (such as gantry A-frames and jib struts), and components shall be rigged or supported to maintain stability upon the removal of the pins.

(8) Snagging. Suspension ropes and pendants shall not be allowed to catch on the boom or jib connection pins or cotter pins (including keepers and locking pins).

(9) Struck by counterweights. The potential for unintended movement from inadequately supported counterweights and from hoisting counterweights.

(10) Boom hoist brake failure. Each time reliance is to be placed on the boom hoist brake to prevent boom movement during assembly/disassembly, the brake shall be tested prior to such reliance to determine if it is sufficient to prevent boom movement.

If it is not sufficient, a boom hoist pawl, other locking device/back-up braking device, or another method of preventing dangerous movement of the boom (such as blocking or using an assist crane) from a boom hoist brake failure shall be used.

(11) Loss of backward stability. Backward stability before swinging the upperworks, travel, and when attaching or removing equipment components.

(12) Wind speed and weather. The effect of wind speed and weather on the equipment.

(i) [Reserved.]

(j) Cantilevered boom sections. Manufacturer limitations on the maximum amount of boom supported only by cantilevering shall not be exceeded. Where these are unavailable, a California registered professional engineer familiar with the type of equipment involved shall determine in writing this limitation, which shall not be exceeded.

(k) Weight of components. The weight of each of the components shall be readily available.

(l) [Reserved.]

(m) Components and configuration.

(1) The selection of components, and configuration of the equipment, that affect the capacity or safe operation of the equipment shall be in accordance with:

(A) Manufacturer instructions, prohibitions, limitations, and specifications. Where these are unavailable, a California registered professional engineer familiar with the type of equipment involved shall approve, in writing, the selection and configuration of components; or

(B) Approved modifications that meet the requirements of §5027 (Equipment Modifications).

(2) Post-assembly inspection. Upon completion of assembly, the equipment shall be inspected to ensure compliance with subsection (m)(1) (see §5031.6 for post-assembly inspection requirements).

(n) [Reserved.]

(o) Shipping pins. Reusable shipping pins, straps, links, and similar equipment shall be removed. Once they are removed they shall either be stowed or otherwise stored so that they do not present a falling object hazard.

(p) Pile driving. Equipment used for pile driving shall not have a jib attached during pile driving operations.

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(q) Outriggers and Stabilizers. When the load to be handled and the operating radius require the use of outriggers or stabilizers, or at any time when outriggers or stabilizers are used, all of the following requirements shall be met (except as otherwise indicated):

(1) The outriggers or stabilizers shall be either fully extended or, if manufacturer procedures permit, deployed as specified in the load chart.

(2) The outriggers shall be set to remove the equipment weight from the wheels, except for locomotive cranes (see subsection (q)(6) for use of outriggers on locomotive cranes). This provision does not apply to stabilizers.

(3) When outrigger floats are used, they shall be attached to the outriggers. When stabilizer floats are used, they shall be attached to the stabilizers.

(4) Each outrigger or stabilizer shall be visible to the operator or to a signal person during extension and setting.

(5) Outrigger and stabilizer blocking shall:

(A) Meet the requirements in subsections (h)(2) and (h)(3).

(B) Be placed only under the outrigger or stabilizer float/pad of the jack or, where the outrigger or stabilizer is designed without a jack, under the outer bearing surface of the extended outrigger or stabilizer beam.

(6) For locomotive cranes, when using outriggers or stabilizers to handle loads, the manufacturer's procedures shall be followed. When lifting loads without using outriggers or stabilizers, the manufacturer's procedures shall be met regarding truck wedges or screws.

(r) Rigging. In addition to following the requirements in General Industry Safety Orders, Article 101 and other requirements in this and other standards applicable to rigging, when rigging is used for assembly/disassembly, the employer shall ensure that:

(1) The rigging work is done by a qualified rigger.

(2) Synthetic slings are protected from: Abrasive, sharp or acute edges, and configurations that could cause a reduction of the sling's rated capacity, such as distortion or localized compression.

NOTE: Requirements for the protection of wire rope slings are contained in General Industry Safety Orders, Article 101, Section 5042.

(3) When synthetic slings are used, the synthetic sling manufacturer's instructions, limitations, specifications and recommendations shall be followed.

NOTE: Authority cited: Section 142.3, Labor Code. Reference: Section 142.3, Labor Code.



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Add new Section 4992.2 as follows:

§4992.2. Disassembly—Additional Requirements for Dismantling of Booms and Jibs (applies to both the use of manufacturer procedures and employer procedures).

Dismantling (including dismantling for changing the length of) booms and jibs.

(a) None of the pins in the pendants are to be removed (partly or completely) when the pendants are in tension.

(b) None of the pins (top or bottom) on boom sections located between the pendant attachment points and the crane/derrick body are to be removed (partly or completely) when the pendants are in tension.

(c) None of the pins (top or bottom) on boom sections located between the uppermost boom section and the crane/derrick body are to be removed (partly or completely) when the boom is being supported by the uppermost boom section resting on the ground (or other support).

(d) None of the top pins on boom sections located on the cantilevered portion of the boom being removed (the portion being removed ahead of the pendant attachment points) are to be removed (partly or completely) until the cantilevered section to be removed is fully supported.

NOTE: Authority cited: Section 142.3, Labor Code. Reference: Section 142.3, Labor Code.

Add new Section 4992.3 as follows:

§4992.3. Power Line Safety (Up to 350 kV) – Assembly and Disassembly.

(a) Before assembling or disassembling equipment, the employer shall determine if any part of the equipment, load line, or load (including rigging and lifting accessories) could get, in the direction or area of assembly/disassembly, closer than 20 feet to a power line during the assembly/disassembly process. If so, the employer shall meet the requirements in Option (1), Option (2), or Option (3) of this section, as follows:

(1) Option (1) – Deenergize and ground. Confirm from the utility owner/operator that the power line has been deenergized and visibly grounded at the worksite.

(2) Option (2) – 20 foot clearance. Ensure that no part of the equipment, load line or load (including rigging and lifting accessories), gets closer than 20 feet to the power line by implementing the measures specified in subsection (b).

(3) Option (3) – Table A clearance.

(A) Determine the line's voltage and the minimum clearance distance permitted under Table A (see §5003.1).

(B) Determine if any part of the equipment, load line, or load (including rigging and lifting accessories), could get closer than the minimum clearance distance to the power line permitted under Table A (see §5003.1). If so, then the employer shall follow the requirements in subsection (b) to ensure that no part of the equipment, load line, or load (including rigging and lifting accessories), gets closer to the line than the minimum clearance distance.

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(b) Preventing encroachment/electrocution. Where encroachment precautions are required under Option (2), or Option (3) of this section, all of the following requirements shall be met:

(1) Conduct a planning meeting with the A/D Director, operator, assembly/disassembly crew and the other workers who will be in the assembly/disassembly area to review the location of the power line(s) and the steps that will be implemented to prevent encroachment/electrocution.

(2) If tag lines are used, they shall be nonconductive.

(3) At least one of the following additional measures shall be in place. The measure selected from this list shall be effective in preventing encroachment.

The additional measures are:

(A) Use a dedicated spotter who is in continuous contact with the equipment operator. The dedicated spotter shall:

1. Be equipped with a visual aid to assist in identifying the minimum clearance distance.

Examples of a visual aid include, but are not limited to: A clearly visible line painted on the ground; a clearly visible line of stanchions; a set of clearly visible line-of-sight landmarks (such as a fence post behind the dedicated spotter and a building corner ahead of the dedicated spotter).

2. Be positioned to effectively gauge the clearance distance.

3. Where necessary, use equipment that enables the dedicated spotter to communicate directly with the operator.

4. Give timely information to the operator so that the required clearance distance can be maintained.

(B) An elevated warning line, barricade, or line of signs, in view of the operator, equipped with flags or similar high-visibility markings.

(c) Assembly/disassembly below power lines prohibited. No part of a crane/derrick, load line, or load (including rigging and lifting accessories), whether partially or fully assembled, is allowed below a power line unless the employer has confirmed that the utility owner/operator has deenergized and (at the worksite) visibly grounded the power line.

(d) Assembly/disassembly inside Table A clearance prohibited. No part of a crane/derrick, load line, or load (including rigging and lifting accessories), whether partially or fully assembled, is allowed closer than the minimum approach distance under Table A (see §5003.1) to a power line unless the employer has confirmed that the utility owner/operator has deenergized and (at the worksite) visibly grounded the power line.

(e) Voltage information. Where Option (3) of this section is used, the utility owner/operator of the power lines shall provide the requested voltage information within two working days of the employer's request.

(f) Power lines presumed energized. The employer shall assume that all power lines are energized unless the utility owner/operator confirms that the power line has been and continues to be deenergized and visibly grounded at the worksite.

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(g) Posting of electrocution warnings. There shall be at least one electrocution hazard warning conspicuously posted in the cab so that it is in view of the operator and (except for overhead gantry and tower cranes) at least two on the outside of the equipment.

NOTE: Authority cited: Section 142.3, Labor Code. Reference: Section 142.3, Labor Code.

Amend Section 4994 to read:

§4994. Hoisting.

\*\*\*

(f) Plan development. Before beginning a crane/derrick operation in which more than one crane/derrick will be supporting the load, the operation shall be planned. The planning shall meet the following requirements:

(1) The plan shall be developed by a qualified person.

(2) The plan shall be designed to ensure that the requirements of Group 13 are met.

(3) Where the qualified person determines that engineering expertise is needed for the planning, the employer shall ensure that it is provided.

(4) The lift director shall review the plan in a meeting with all workers who will be involved with the operation.

NOTE: Authority cited: Section 142.3, Labor Code. Reference: Section 142.3, Labor Code.

Amend section 4999 as follows:

§4999. Handling Loads.

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(f) During Hoisting:

(1) There shall be no sudden acceleration or deceleration of the moving load.

(2) ~~Inadvertent contact with obstructions shall be prevented.~~ The boom or other parts of the equipment shall not contact any obstruction.

\*\*\*

(k) On ~~truck~~ wheel-mounted cranes, no loads shall be lifted over the front area except as permitted by the manufacturer. ~~approved by the certified agency.~~

NOTE: Authority cited: Section 142.3, Labor Code. Reference: Section 142.3, Labor Code.

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Amend Section 5001 as follows:

§5001. Signals – General Requirements.

(a) A signal person shall be provided in each of the following situations: when the point of operation is not in full and direct view of the operator unless a signaling or control device is provided for safe direction of the operator.

(1) The point of operation, meaning the load travel or the area near or at load placement, is not in full view of the operator.

(2) When the equipment is traveling, the view in the direction of travel is obstructed.

(3) Due to site-specific safety concerns, either the operator or the person handling the load determines that it is necessary.

(b) Only qualified persons shall be permitted to give signals.

EXCEPTION: An emergency stop signal may be given by any person.

(c) Types of signals. Signals to operators shall be by hand, voice, audible, or new signals.

(d) Hand Signals. ~~(e)~~ A uniform signal system shall be used on all operations, ~~and~~

(1) If hand signals are used, they shall be clearly understood by the operator. (NOTE: See recommended hand signals, see Plate I.)

EXCEPTION: Where an operation or use of an attachment is not covered in the Standard Method, nonstandard hand signals may be used in accordance with subsection (d)(2).

(2) Non-standard hand signals. When using non-standard hand signals, the signal person, operator, and lift director (where there is one) shall contact each other prior to the operation and agree on the non-standard hand signals that will be used.

(3) ~~(e)~~ There shall be conspicuously posted in the vicinity of the hoisting operations, a legible chart depicting and explaining the system of signals used.

(e) New signals. Signals other than hand, voice, or audible signals may be used where the employer demonstrates that:

(1) The new signals provide at least equally effective communication as voice, audible, or Standard Method hand signals, or

(2) The new signals comply with a national consensus standard that provides at least equally effective communication as voice, audible, or Standard Method hand signals.

(f) Suitability. The signals used (hand, voice, audible, or new), and means of transmitting the signals to the operator (such as direct line of sight, video, radio, etc.), shall be appropriate for the site conditions.

~~(1) When there is a potential for accidental contact by cranes operating within the boom swing radii of one another, the employer shall ensure effective communication to notify crane operators and signal persons of the presence of other cranes.~~

~~(2) Where two-way radios are used, a dedicated frequency shall be provided for communication among operators. [Existing subsection (f) relocated to (k) below]~~

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(g) During operations requiring signals, the ability to transmit signals between the operator and signal person shall be maintained. If that ability is interrupted at any time, the operator shall safely stop operations requiring signals until it is reestablished and a proper signal is given and understood.

(1) ~~(d)~~ Signal systems other than manual shall be protected against unauthorized use, breakage, weather or obstruction which will interfere with safe operation. In the event of any known malfunction, an alternate signal system shall be used or all motion shall be stopped.

(h) If the operator becomes aware of a safety problem and needs to communicate with the signal person, the operator shall safely stop operations. Operations shall not resume until the operator and signal person agree that the problem has been resolved.

(i) All directions given to the operator by the signal person shall be given from the operator's direction perspective.

(j) Communication with multiple cranes/derricks.

Where a signal person(s) is in communication with more than one crane/derrick, a system shall be used for identifying the crane/derrick each signal is for, as follows:

(1) for each signal, prior to giving the function/direction, the signal person shall identify the crane/derrick the signal is for, or

(2) shall use an equally effective method of identifying which crane/derrick the signal is for.

(k) Work area control.

~~(1)~~ When there is a potential for accidental contact by cranes operating within the boom swing radii of one another, the employer shall ensure effective communication to notify crane operators and signal persons of the presence of other cranes to coordinate operations.

~~(2)~~ Where two-way radios are used, a dedicated frequency shall be provided for communication among operators.

NOTE: Authority cited: Section 142.3, Labor Code. Reference: Section 142.3, Labor Code.

Add new Section 5001.1 as follows:

§5001.1. Signals – Radio, Telephone or other Electronic Transmission Of Signals.

(a) The device(s) used to transmit signals shall be tested on site before beginning operations to ensure that the signal transmission is effective, clear, and reliable.

(b) Signal transmission must be through a dedicated channel, except:

(1) Multiple cranes/derricks and one or more signal persons may share a dedicated channel for the purpose of coordinating operations.

(2) Where a crane is being operated on or adjacent to railroad tracks, and the actions of the crane operator need to be coordinated with the movement of other equipment or trains on the same or adjacent tracks.

(c) The operator's reception of signals shall be by a hands-free system.

NOTE: Authority cited: Section 142.3, Labor Code. Reference: Section 142.3, Labor Code.

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Add new Section 5001.2 as follows:

§5001.2. Signals – Voice Signals – Additional Requirements.

(a) Prior to beginning operations, the operator, signal person and lift director (if there is one), shall contact each other and agree on the voice signals that will be used. Once the voice signals are agreed upon, these workers need not meet again to discuss voice signals unless another worker is added or substituted, there is confusion about the voice signals, or a voice signal is to be changed.

(b) Each voice signal shall contain the following three elements, given in the following order: function (such as hoist, boom, etc.), direction; distance and/or speed; function, stop command.

(c) The operator, signal person and lift director (if there is one), shall be able to effectively communicate in the language used.

NOTE: Authority cited: Section 142.3, Labor Code. Reference: Section 142.3, Labor Code.

Add new Section 5001.3 to read:

§5001.3. Signal Person Qualifications.

(a) The employer of the signal person shall ensure that each signal person meets the Qualification Requirements (subsection (c) of this section) prior to giving any signals. This requirement shall be met by using either Option (1) or Option (2) of this subsection.

(1) Option (1) – Third party qualified evaluator. The signal person has documentation from a third party qualified evaluator [see Qualified Evaluator (third party), Section 4885 for definition] showing that the signal person meets the Qualification Requirements [see subsection (c)].

(2) Option (2) – Employer’s qualified evaluator. The employer’s qualified [see Qualified Evaluator (not a third party), Section 4885 for definition] evaluator assesses the individual and determines that the individual meets the Qualification Requirements [see subsection (c)] and provides documentation of that determination. An assessment by an employer’s qualified evaluator under this option is not portable – other employers are not permitted to use it to meet the requirements of this subsection.

(3) The employer shall make the documentation for whichever option is used available at the site while the signal person is employed by the employer. The documentation shall specify each type of signaling (e.g. hand signals, radio signals, etc.) for which the signal person meets the requirements of subsection (c).

(b) If subsequent actions by the signal person indicate that the individual does not meet the Qualification Requirements [see subsection (c)], the employer shall not allow the individual to continue working as a signal person until re-training is provided and a re-assessment is made in

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accordance with subsection (a) that confirms that the individual meets the Qualification Requirements.

(c) Qualification Requirements. Each signal person shall:

(1) Know and understand the type of signals used. If hand signals are used, the signal person shall know and understand the Standard Method for hand signals.

(2) Be competent in the application of the type of signals used.

(3) Have a basic understanding of equipment operation and limitations, including the crane dynamics involved in swinging and stopping loads and boom deflection from hoisting loads.

(4) Know and understand the relevant requirements of Section 5001 and this Section.

(5) Demonstrate that he/she meets the requirements in subsections (c)(1) through (4) of this section through an oral or written test, and through a practical test.

NOTE: Authority cited: Section 142.3, Labor Code. Reference: Section 142.3, Labor Code.

Amend Section 5002 as follows:

§5002. Overhead Loads.

(a) Operations shall be conducted and the job controlled in a manner that will avoid exposure of employees to the hazard of overhead loads. Wherever loads must be passed directly over workers, occupied work spaces or occupied passageways, safety type hooks or equivalent means of preventing the loads from becoming disengaged shall be used.

NOTE: Employees should not work in the area directly beneath a suspended load.

(b) While the operator is not moving a suspended load, no employee shall be within the fall zone, except for employees:

(1) Engaged in hooking, unhooking or guiding a load;

(2) Engaged in the initial attachment of the load to a component or structure; or

(3) Operating a concrete hopper or concrete bucket.

(c) When employees are engaged in hooking, unhooking, or guiding the load, or in the initial connection of a load to a component or structure and are within the fall zone, all of the following criteria shall be met:

(1) The materials being hoisted shall be rigged to prevent unintentional displacement.

(2) The materials shall be rigged by a qualified rigger.

(d) Receiving a load. Only employees needed to receive a load shall be permitted to be within the fall zone when a load is being landed.

(e) During a tilt-up or tilt-down operation:

(1) No employee shall be directly under the load.

(2) Only employees essential to the operation are permitted in the fall zone (but not directly under the load). An employee is essential to the operation if the employee is conducting one of the following operations and the employer can demonstrate it is infeasible for the employee to perform that operation from outside the fall zone:

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(A) Physically guide the load;

(B) Closely monitor and give instructions regarding the load's movement; or

(C) Either detach it from or initially attach it to another component or structure (such as, but not limited to, making an initial connection or installing bracing).

NOTE: Boom free fall is prohibited when an employee is in the fall zone of the boom or load, and load line free fall is prohibited when an employee is directly under the load; see §5002.1.

NOTE: Authority and reference cited: Section 142.3, Labor Code.

Add new Section 5002.1 as follows:

§5002.1. Boom and Load Line Free Fall.

(a) Boom free fall prohibitions.

(1) The use of equipment in which the boom is designed to free fall (live boom) is prohibited in each of the following circumstances:

(A) An employee is in the fall zone of the boom or load.

(B) An employee is being hoisted.

(C) The load or boom is directly over a power line, or over any part of the area extending the Table A of §5003.1 clearance distance to each side of the power line; or any part of the area extending the Table A clearance distance to each side of the power line is within the radius of vertical travel of the boom or the load.

(D) The load is over a shaft, except where there are no employees in the shaft.

(E) The load is over a cofferdam, except where there are no employees in the fall zone of the boom or the load.

(F) Lifting operations are taking place in a refinery or tank farm.

(2) The use of equipment in which the boom is designed to free fall (live boom) is permitted only where none of the circumstances listed in subsection (a)(1) are present and:

(A) The equipment was manufactured prior to October 31, 1984; or

(B) The equipment is a floating crane/derrick or a land crane/derrick on a vessel/flotation device.

(b) Preventing boom free fall. Where the use of equipment with a boom that is designed to free fall (live boom) is prohibited, the boom hoist shall have a secondary mechanism or device designed to prevent the boom from falling in the event the primary system used to hold or regulate the boom hoist fails, as follows:

(1) Friction drums shall have:

(A) A friction clutch and, in addition, a braking device, to allow for controlled boom lowering.

(B) A secondary braking or locking device, which is manually or automatically engaged, to back-up the primary brake while the boom is held (such as a secondary friction brake or a ratchet and pawl device).



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(2) Hydraulic drums shall have an integrally mounted holding device or internal static brake to prevent boom hoist movement in the event of hydraulic failure.

(3) Neither clutches nor hydraulic motors shall be considered brake or locking devices for purposes of Group 13.

(4) Hydraulic boom cylinders shall have an integrally mounted holding device.

(c) Load line free fall. In each of the following circumstances, controlled load lowering is required and free fall of the load line hoist is prohibited:

(1) An employee is directly under the load.

(2) An employee is being hoisted.

(3) The load is directly over a power line, or over any part of the area extending the Table A of §5003.1 clearance distance to each side of the power line; or any part of the area extending the Table A of §5003.1 clearance distance to each side of the power line is within the radius of vertical travel of the load.

(4) The load is over a shaft.

(5) The load is over a cofferdam, except where there are no employees in the fall zone of the load.

NOTE: Authority cited: Section 142.3, Labor Code. Reference: Section 142.3, Labor Code.

Amend Section 5003 as follows:

§5003. Provisions for Preventing Accidents in the Area of ~~High-Voltage~~ Power Lines or Energized Transmitters.

(a) All equipment covered by Group 13 shall comply with the following requirements when working or being moved in the vicinity of power lines or energized transmitters, except where electrical distribution and transmission lines have been deenergized and visibly grounded at point of work or where insulating barriers, not a part of or an attachment to the equipment or machinery, have been erected to prevent physical contact with the lines:

(1) For lines rated 600 V or below, minimum clearance between the lines and any part of the crane or load shall be 10 feet.

(2) ~~Provisions for preventing accidents due to overhead high-voltage lines~~ For lines rated over 600 V, minimum clearance between the lines and any part of the crane or load shall be in conformance with the High-Voltage Electrical Safety Orders, Article 37.

(3) In transit with no load and boom lowered, the equipment clearance shall be a minimum of 4 feet for voltages less than 600 V, 6 feet for voltages 600 V up to and including 50 kV, 10 feet for voltages over 50 kV, up to and including 345 kV, 16 feet for voltages up to and including 750 kV; and 20 feet for voltages above 750,000 kV.

(4) A person shall be designated to observe clearance of the equipment and give timely warning for all operations where it is difficult for the operator to maintain the desired clearance by visual means.

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(5) Cage-type boom guards, insulating links, or proximity warning devices may be used on cranes, but the use of such devices shall not alter the requirements of any other section of these Safety Orders even if such device is required by law or regulation.

(6) Prior to work near transmitter towers where an electrical charge can be induced in the equipment or materials being handled, the transmitter shall be de-energized or tests shall be made to determine if electrical charge is induced on the crane. The following precautions shall be taken when necessary to dissipate induced voltages:

(A) The equipment shall be provided with an electrical ground directly to the upper rotating structure supporting the boom; and

(B) Ground jumper cables shall be attached to materials being handled by boom equipment when electrical charge is induced while working near energized transmitters. Crews shall be provided with nonconductive poles having large alligator clips or other similar protection to attach the ground cable to the load.

(C) Combustible and flammable materials shall be removed from the immediate area prior to operations.

NOTE: Authority cited: Sections 142.3 and 6500, Labor Code. Reference: Section 142.3, Labor Code.

Add new Section 5003.1 as follows:

5003.1. Power Line Safety (Up to 350 kV) – Equipment Operations.

(a) Hazard assessments and precautions inside the work zone. Before beginning equipment operations, the employer shall:

(1) Identify the work zone by either:

(A) Demarcating boundaries (such as with flags, or a device such as a range limit device or range control warning device) and prohibiting the operator from operating the equipment past those boundaries, or

(B) Defining the work zone as the area 360 degrees around the equipment, up to the equipment's maximum working radius.

(2) Determine if any part of the equipment, load line or load (including rigging and lifting accessories), if operated up to the equipment's maximum working radius in the work zone, could get closer than 20 feet to a power line. If so, the employer shall meet the requirements in Option (1), Option (2), or Option (3) of this section, as follows:

(A) Option (1) – Deenergize and ground. Confirm from the utility owner/operator that the power line has been deenergized and visibly grounded at the worksite.

(B) Option (2) – 20 foot clearance. Ensure that no part of the equipment, load line, or load (including rigging and lifting accessories), gets closer than 20 feet to the power line by implementing the measures specified in subsection (b).

(C) Option (3) – Table A clearance.

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1. Determine the line's voltage and the minimum approach distance permitted under Table A.
2. Determine if any part of the equipment, load line or load (including rigging and lifting accessories), while operating up to the equipment's maximum working radius in the work zone, could get closer than the minimum approach distance of the power line permitted under Table A. If so, then the employer shall follow the requirements in subsection (b) to ensure that no part of the equipment, load line, or load (including rigging and lifting accessories), gets closer to the line than the minimum approach distance.
- (b) Preventing encroachment/electrocution. Where encroachment precautions are required under Option (2) or Option (3) of this section, all of the following requirements shall be met:
  - (1) Conduct a planning meeting with the operator and the other workers who will be in the area of the equipment or load to review the location of the power line(s), and the steps that will be implemented to prevent encroachment/electrocution.
  - (2) If tag lines are used, they shall be non-conductive.
  - (3) Erect and maintain an elevated warning line, barricade, or line of signs, in view of the operator, equipped with flags or similar high-visibility markings, at 20 feet from the power line (if using Option (2) of this section) or at the minimum approach distance under Table A (if using Option (3) of this section). If the operator is unable to see the elevated warning line, a dedicated spotter shall be used as described in subsection (b)(4)(B) in addition to implementing one of the measures described in subsections (b)(4)(A), (C), (D) and (E).
  - (4) Implement at least one of the following measures:
    - (A) A dedicated spotter who is in continuous contact with the operator. Where this measure is selected, the dedicated spotter shall:
      1. Be equipped with a visual aid to assist in identifying the minimum clearance distance. Examples of a visual aid include, but are not limited to: A clearly visible line painted on the ground; a clearly visible line of stanchions; a set of clearly visible line-of-sight landmarks (such as a fence post behind the dedicated spotter and a building corner ahead of the dedicated spotter).
      2. Be positioned to effectively gauge the clearance distance.
      3. Where necessary, use equipment that enables the dedicated spotter to communicate directly with the operator.
      4. Give timely information to the operator so that the required clearance distance can be maintained.
    - (B) A device that automatically warns the operator when to stop movement, such as a range control warning device. Such a device shall be set to give the operator sufficient warning to prevent encroachment.
    - (C) A device that automatically limits range of movement, set to prevent encroachment.
  - (5) The requirements of subsection (b)(4) do not apply to work covered by the High-Voltage Electrical Safety Orders.

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(c) Voltage information. Where Option (3) of this section is used, the utility owner/operator of the power lines shall provide the requested voltage information within two working days of the employer's request.

(d) Operations below power lines.

(1) No part of the equipment, load line, or load (including rigging and lifting accessories) is allowed below a power line unless the employer has confirmed that the utility owner/operator has deenergized and (at the worksite) visibly grounded the power line, except where one of the exceptions in subsection (d)(2) applies.

(2) EXCEPTIONS. Subsection (d)(1) is inapplicable where the employer demonstrates that one of the following applies:

(A) The work is covered by the High-Voltage Electrical Safety Orders.

(B) For equipment with nonextendable booms: The uppermost part of the equipment, with the boom at true vertical, would be more than 20 feet below the plane of the power line or more than the Table A of this section minimum clearance distance below the plane of the power line.

(C) For equipment with articulating or extendable booms: The uppermost part of the equipment, with the boom in the fully extended position, at true vertical, would be more than 20 feet below the plane of the power line or more than the Table A of this section minimum clearance distance below the plane of the power line.

(D) The employer demonstrates that compliance with subsection (d)(1) is infeasible and meets the requirements of §5003.3.

(e) Power lines presumed energized.

The employer shall assume that all power lines are energized unless the utility owner/operator confirms that the power line has been and continues to be deenergized and visibly grounded at the worksite.

(f) When working near transmitter/communication towers where the equipment is close enough for an electrical charge to be induced in the equipment or materials being handled, the transmitter shall be deenergized or the following precautions shall be taken:

(1) The equipment shall be provided with an electrical ground.

(2) If tag lines are used, they shall be non-conductive.

(g) Training.

(1) The employer shall train each operator and crew member assigned to work with the equipment on all of the following:

(A) The procedures to be followed in the event of electrical contact with a power line. Such training shall include:

1. Information regarding the danger of electrocution from the operator simultaneously touching the equipment and the ground.

2. The importance to the operator's safety of remaining inside the cab except where there is an imminent danger of fire, explosion, or other emergency that necessitates leaving the cab.

3. The safest means of evacuating from equipment that may be energized.

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4. The danger of the potentially energized zone around the equipment (step potential).

5. The need for crew in the area to avoid approaching or touching the equipment and the load.

6. Safe clearance distance from power lines.

(B) Power lines are presumed to be energized unless the utility owner/operator confirms that the power line has been and continues to be deenergized and visibly grounded at the worksite.

(C) Power lines are presumed to be uninsulated unless the utility owner/operator or a registered engineer who is a qualified person with respect to electrical power transmission and distribution confirms that a line is insulated.

(D) The limitations of a range control device, if used.

(E) The procedures to be followed to properly ground equipment and the limitations of grounding.

(2) Employees working as dedicated spotters shall be trained to enable them to effectively perform their task, including training on the applicable requirements of this section.

(3) Training under this section shall be administered in accordance with §4884.3.

(h) Devices originally designed by the manufacturer for use as: A safety device (see §5015), operational aid, or a means to prevent power line contact or electrocution, when used to comply with this section, shall meet the manufacturer's procedures for use and conditions of use.

TABLE A—MINIMUM CLEARANCE DISTANCES

<u>Voltage</u> <u>(nominal, kV, alternating current)</u>	<u>Minimum clearance distance</u> <u>(feet)</u>
<u>up to 50</u>	<u>10</u>
<u>over 50 to 175</u>	<u>15</u>
<u>over 175 to 350</u>	<u>20</u>
<u>over 350 to 550</u>	<u>27</u>
<u>over 550 to 1,000</u>	<u>45</u>
<u>over 1,000</u>	<u>(as established by the utility owner/operator or registered professional engineer who is a qualified person with respect to electrical power transmission and distribution).</u>

**NOTE:** The value that follows “to” is up to and includes that value. For example, over 50 to 200 means up to and including 200kV.

**NOTE:** Authority cited: Sections 142.3 and 6500, Labor Code. Reference: Section 142.3, Labor Code.

Add new Section 5003.2 as follows:

§5003.2. Power Line Safety (Over 350 kV).

The requirements of §4992.3 and §5003.1 apply to power lines over 350 kV except:

(a) For power lines at or below 1000 kV, wherever the distance “20 feet” is specified, the distance “50 feet” shall be substituted; and

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(b) For power lines over 1000 kV, the minimum clearance distance shall be established by the utility owner/operator or registered professional engineer who is a qualified person with respect to electrical power transmission and distribution.

NOTE: Authority cited: Sections 142.3 and 6500, Labor Code. Reference: Section 142.3, Labor Code.

Add new Section 5003.3 as follows:

§5003.3. Power Line Safety (All Voltages)—Equipment Operations Closer than the Table A Zone.

Equipment operations in which any part of the equipment, load line, or load (including rigging and lifting accessories) is closer than the minimum approach distance under Table A of §5003.1 to an energized power line is prohibited.

NOTE: Authority cited: Sections 142.3 and 6500, Labor Code. Reference: Section 142.3, Labor Code.

Amend Section 5004 to read:

§5004. Crane or Derrick Suspended Personnel Platforms.

(a) Scope. These Orders apply to the design, construction, testing, use and maintenance of personnel platforms, and the hoisting of personnel platforms on load lines of cranes and derricks or on boom attached personnel platforms.

\*\*\*

(d) Operational Criteria

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(4) The crane shall be uniformly level within one percent of level grade, and located on firm footing that a qualified person has determined to be sufficiently firm and stable. ~~Cranes equipped~~ Equipment with outriggers or stabilizers shall have them all extended and locked. The amount of extension shall be the same for all outriggers and stabilizers and in accordance with the manufacturer procedures and load charts. fully deployed following manufacturer's specifications, insofar as applicable, when hoisting employees.

\*\*\*

(e) Instruments and Components.

(1) Cranes and derricks with variable angle booms shall be equipped with a boom angle indicator, readily visible to the operator.

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(2) Cranes with telescoping booms shall be equipped with a device to indicate clearly to the operator, at all times, the boom's extended length, or an accurate determination of the load radius to be used during the lift shall be made prior to hoisting personnel.

(3)(A) An anti two-block device shall be used which when activated, disengages all crane functions that can cause two-blocking. The device(s) shall prevent such damage/failure at all points where two-blocking could occur.

EXCEPTION: This device is not required when hoisting personnel in pile driving operations.

Instead Section 5004(k)(14) specifies how to prevent two-blocking during such operations.

(B) When a derrick is used to hoist personnel platforms, limiting devices shall be installed to prevent two-blocking.

(4) The load line hoist drum shall have a system or device on the power train, other than the hoist brake, which regulates the lowering rate of speed of the hoist mechanism (controlled load lowering).

Free fall of the load line hoist is prohibited; the use of equipment in which the boom hoist mechanism can free fall is also prohibited.

(5) A boom hoist limiting device.

(6) Articulating cranes shall be equipped with a properly functioning automatic overload protection device.

(7) Equipment with a luffing jib shall be equipped with:

(A) A jib angle indicator, readily visible to the operator, and,

(B) A job hoist limiting device

\*\*\*

(g) Platform Specifications.

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(6) In addition to the use of hard hats, employees shall be protected by overhead protection on the personnel platform when employees are exposed to falling objects. The platform overhead protection shall not obscure the view of the operator or platform occupants (such as mire mesh that has up to 1/2 inch openings), unless full protection is necessary.

\*\*\*

(i) Rigging.

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(2) Hooks on overhaul ball assemblies, lower load blocks, or other attachments assemblies shall be of a type that can be closed and locked, eliminating the hook throat opening and closed and locked when attached. Alternatively, an alloy anchor type shackle with a bolt, nut and retaining pin may be used.

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(k) Work Practices.

(1) Employees shall:

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(A) ~~K~~keep all parts of the body inside the platform during raising, lowering, and positioning. This provision does not apply to an occupant of the platform when necessary to position the platform or while performing the duties of a signal person.

(B) Not stand, sit on, or work from the top or intermediate rail or toeboard, or use any other means/device to raise their working height.

(C) Not pull the platform out of plumb in relation to the hoisting equipment.

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(5) Hoisting of employees shall be promptly discontinued upon indication of any dangerous weather conditions or other impending danger.

(A) When wind speed (sustained or gusts) exceeds 20 mph at the personnel platform, a qualified person shall determine if, in light of the wind conditions, it is not safe to lift personnel. If it is not, the lifting operation shall not begin (or, if already in progress, shall be terminated).

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(9) When using equipment to hoist employees, the employees shall be in a personnel platform that meets the requirements of Section 5004(h) and (i) of these Orders.

EXCEPTIONS: A personnel platform is not required for hoisting employees:

1. Into and out of drill shafts that are up to and including 8 feet in diameter (see subsection (k)(13) for requirements for hoisting these employees).

2. In pile driving operations (see Section 5004(d) for requirements for hoisting these employees).

3. Solely for transfer to or from a marine worksite in a marine-hoisted personnel transfer device (see subsection (k)(18) for requirements for hoisting these employees).

4. In storage-tank (steel or concrete), shaft and chimney operations (see subsection (k)(19) for hoisting these employees).

(10) If the platform is tied to the structure, the operator shall not move the platform until the operator receives confirmation that it is freely suspended.

(11) Platforms with controls. Where the platform is equipped with controls, all of the following shall be met at all times while the platform is occupied:

(A) The occupant using the controls in the platform shall be a qualified person with respect to their use, including the safe limitations of the equipment and hazards associated with its operation.

(B) The equipment operator shall be at a set of equipment controls that include boom and swing functions of the equipment, and shall be on site and in view of the equipment.

(C) The platform operating manual shall be in the platform or on the equipment.

(12) Factory-produced boom-mounted personnel platforms that incorporate a winch as original equipment. Loads are permitted to be hoisted by such a winch while employees occupy the personnel platform only where the load on the winch line does not exceed 500 pounds and does not exceed the rated capacity of the winch and platform.



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(13) Hoisting personnel in drill shafts. When hoisting employees into and out of drill shafts that are up to and including 8 feet in diameter, all of the following requirements shall be met:

(A) The employee shall be in either a personnel platform or on a boatswain's chair.

(B) If using a personnel platform, all applicable parts of Section 5004 apply.

(C) If using a boatswain's chair:

1. A signal person shall be stationed at the shaft opening.

2. The employee shall be hoisted in a slow, controlled descent and ascent.

3. The employee shall use personal fall protection equipment, including a full body harness, attached independent of the crane/derrick.

4. The fall protection equipment shall meet the applicable requirements in Article 24 of the Construction Safety Orders.

5. The boatswain's chair itself (excluding the personal fall arrest system anchorages), shall be capable of supporting, without failure, its own weight and at least five times the maximum intended load.

6. No more than one person shall be hoisted at a time.

(14) Hoisting personnel for pile driving operations. When hoisting an employee in pile driving operations, the following requirements shall be met:

(A) The employee shall be in a personnel platform or boatswain's chair.

(B) For lattice boom cranes: Clearly mark the cable (so that it can easily be seen by the operator) at a point that will give the operator sufficient time to stop the hoist to prevent two-blocking, or use a spotter who is in direct communication with the operator to inform the operator when this point is reached. For telescopic boom cranes: Clearly mark the cable (so that it can be easily seen by the operator) at a point that will give the operator sufficient time to stop the hoist to prevent two-blocking, and use a spotter who is in direct communication with the operator to inform the operator when this point is reached.

(C) If using a personnel platform, all applicable parts of Section 5004 apply.

(D) If using a boatswain's chair:

1. The employee shall be hoisted in a slow, controlled descent and ascent.

2. The employee shall use personal fall protection equipment, including a full body harness, independently attached to the lower load block or overhaul ball.

3. The fall protection equipment shall meet the applicable requirements in Article 24 of the Construction Safety Orders.

4. The boatswain's chair itself (excluding the personal fall arrest system anchorages), shall be capable of supporting, without failure, its own weight and at least five times the maximum intended load.

5. No more than one person shall be hoisted at a time.

(15) Hoisting personnel for marine transfer. When hoisting employees solely for transfer to or from a marine worksite, the following requirements shall be met:

(A) The employee shall be in either a personnel platform or a marine-hoisted personnel transfer device.

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(B) If using a personnel platform, all applicable parts of Section 5004 apply.

(C) If using a marine-hoisted personnel transfer device:

(1) The transfer device shall be used only for transferring workers.

(2) The number of workers occupying the transfer device shall not exceed the maximum number it was designed to hold.

(3) Each employee shall wear a U.S. Coast Guard personal flotation device approved for industrial use.

(16) Hoisting personnel for storage-tank (steel or concrete), shaft and chimney operations.

When hoisting an employee in storage tank (steel or concrete), shaft and chimney operations, the following requirements shall be met:

(A) The employee shall be in a personnel platform except when the employer can demonstrate that use of a personnel platform is infeasible; in such a case, a boatswain's chair shall be used.

(B) If using a personnel platform, all applicable parts of Section 5004 apply.

(C) If using a boatswain's chair:

1. The employee shall be hoisted in a slow, controlled descent and ascent.

2. The employee shall use personal fall protection equipment, including a full body harness, attached independent of the crane/derrick. When there is no adequate structure for attachment of personal fall arrest equipment as required in Article 24 of the Construction Safety Orders, the attachment shall be to the lower load block or overhaul ball.

3. The fall protection equipment shall meet the applicable requirements in Article 24 of the Construction Safety Orders.

4. The boatswain's chair itself (excluding the personal fall arrest system anchorages), shall be capable of supporting, without failure, its own weight and at least five times the maximum intended load.

5. No more than one person shall be hoisted at a time.

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NOTE: Authority cited: Section 142.3, Labor Code. Reference: Section 142.3, Labor Code.

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TITLE 8: Division 1, Chapter 4, Subchapter 7. General Industry Safety Orders  
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Amend Section 5006 to read:

§5006. Crane and Hoisting Equipment Operators—Qualifications.

- (a) Only employees authorized by the employer and trained in the safe operation of cranes or hoisting apparatus shall be permitted to operate such equipment.
- (b) Trainees may be authorized to operate cranes or hoisting apparatus provided they are under the supervision of a qualified operator.

~~EXCEPTION: Mobile and tower cranes regulated by Section 5006.1.~~

NOTE: Authority cited: Section 142.3, Labor Code. Reference: Section 142.3, Labor Code.

Amend Section 5006.1 to read:

§5006.1. ~~Mobile Crane and Tower Crane~~ Operator Qualifications and Certification.

- (a) Qualifications. The employer shall only permit operators who have a valid certificate of competency (certificate) issued in accordance with this section by an Accredited Certifying Entity for the type of crane to be used to operate a crane covered by this section. Whenever operator qualification or certification is required under Section 5006.1 the employer shall provide the qualification or certification at no cost to operators who are employed by the employer on [Effective date].

Certificates shall be issued to operators who:

- (1) Pass a physical examination conducted by a physician which at a minimum shall include the examination criteria specified in the American Society of Mechanical Engineers (ASME) B30.5-2000 standard, Chapter 5-3.1.2(a)(1-5, 7, 8) or the U.S. Department of Transportation (US DOT) physical examination requirements contained in 49 CFR Sections 391.41 through 391.49.
- (2) Pass a substance abuse test. The level of testing shall be consistent with the standard practice for the industry where the crane is in use and this test shall be conducted by a recognized laboratory service;
- (3) Pass a written examination developed, validated, and administered in accordance with the Standards for Educational and Psychological Testing (Copyright 1999) published jointly by the Joint Committee of the American Educational Research Association, the American Psychological Association, and the National Council in Measurement in Education. The exam shall test knowledge and skills identified as necessary for safe crane operations and shall, at a minimum, include the following:

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(e) Pre-qualification/certification training period. An employee who is not qualified or certified under this section is permitted to operate equipment only as an operator-in-training and only where the requirements of this section are met.

(1) The employer shall provide each operator-in-training with sufficient training prior to operating the equipment to enable the operator-in-training to operate the equipment safely under limitations established by this section (including continuous monitoring) and any additional limitations established by the employer.

(2) The tasks performed by the operator-in-training while operating the equipment shall be within the operator-in-training's ability.

(3)(e) Trainees may be authorized to operate mobile or tower cranes provided they are under the direct supervision of an operator possessing a valid certificate of competency for the type of crane operated by the trainee.

The term direct supervision means the supervising operator is in the immediate area of the trainee and within visual sighting distance and able to effectively communicate with the trainee. When performing direct supervision, the supervising operator shall have no other duties other than to observe the operation of the crane by the trainee.

(4) The operator-in-training shall not operate the equipment in any of the following circumstances.

(1) If any part of the equipment, load line or load (including rigging and lifting accessories), if operated up to the equipment's maximum working radius in the work zone [see §5003.1(a)(1)] could get within 20 feet of a power line that is up to 350 kV, or within 50 feet of a power line that is over 350 kV.

(2) If the equipment is used to hoist personnel.

(3) In multiple-equipment lifts.

(4) If the equipment is used over a cofferdam, or in a tank farm.

(5) In multiple-lift rigging operations.

EXCEPTION for (e)(4): Where the operator's trainer determines that the operator-in-training skills are sufficient for this high skill work.

(f) ~~Effective Date. The requirements of Section 5006.1 shall become effective on June 1, 2005.~~  
Phase-in.

(1) The provisions of this section are applicable [Effective date], except for subsections (a) through (d) which are applicable [Effective date plus four years] for cranes with a maximum manufacturer- rated hoisting/lifting capacity of over 2000 pounds to 14,999 pounds.

(2) When Section 5006.1(a)-(d) are not applicable, all of the requirements in subsections (e) and (f)(2)(A) and (B) of this section apply.

(A) The employer shall ensure that operators of equipment covered by this standard are competent to operate the equipment safely.

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(B) Where an employee assigned to operate machinery does not have the required knowledge or ability to operate the equipment safely, the employer shall train that employee prior to operating the equipment. The employer shall ensure that each operator is evaluated to confirm that he/she understands the information provided in the training.

EXCEPTIONS TO SECTION 5006.1:

(1) ~~Mobile cranes having a boom length of less than 25 feet or~~ Operator qualification or certification under this section is not required for operation of derricks, side boom cranes or equipment with a maximum manufacturer-rated hoisting/lifting capacity of ~~rated load capacity of less than 15,000 pounds~~ 2000 pounds or less.

(2) Operators of electric line trucks (digger derrick trucks) as defined in Section 2700 of the Electrical Safety Orders, and regulated by Section 2940.7 of the High Voltage Electrical Safety Orders. This exception does not include mobile truck cranes designed and built in accordance with the American Society of Mechanical Engineers (ASME) B30.5 standards.

(3) Marine terminal operations regulated by Article 14 of these Orders.

(4) Bridge and gantry cranes used in general industry.

NOTE: Authority cited: Section 142.3, Labor Code. Reference: Section 142.3, Labor Code.

Amend Section 5008 as follows:

§5008. Operating Practices.

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(b) The operator shall respond to signals only from the appointed signal person, but shall obey an emergency stop signal from any person.

(c) Whenever the operator doubts the safety of a movement, the operator shall have the authority ~~be authorized~~ to stop the hoisting operation until a qualified person has determined that safety has been assured.

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(f) Before closing the switch or starting the engine, all controls shall be in the "off" position and all personnel in the clear.

(g) If power fails during operation, the operator shall be required to:

- (1) Set all brakes and locking devices;
- (2) Move all clutch or other power controls to the "off" position;
- (3) If practical, the suspended load shall be landed under brake control.

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(h) The operator shall be required to test all controls at the start of a new shift...

NOTE: Authority cited: Section 142.3, Labor Code. Reference: Section 142.3, Labor Code.

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Add new Section 5008.1 as follows:

§5008.1. Operation.

(a) The employer shall comply with all manufacturer procedures applicable to the operational functions of equipment, including its use with attachments.

(b) Each crane shall be provided with a descriptive booklet, written in English, containing a comprehensive summary of design characteristics, erection procedures, operation techniques, repair recommendations, and safety precautions. This booklet shall be available on every job site where such cranes are in use.

(c) A durable, clearly legible load rating chart shall be provided with each crane and securely affixed in the cab or operator's station easily visible to the operator while at the controls. The chart shall include load ratings and restrictions as specified by the certified agent for specific lengths of components, counterweights, swing, and radii. Where load ratings for cranes are governed by structural competence, the limitation on loading shall be such that no structural member is overstressed, and load rating charts shall be subject to this limitation.

(1) Where rated capacities are available in the cab only in electronic form: In the event of a failure which makes the rated capacities inaccessible, the operator shall immediately cease operations or follow safe shut-down procedures until the rated capacities (in electronic or other form) are available.

(d) Unavailable operation procedures.

(1) Where the manufacturer procedures are unavailable, the employer shall develop and ensure compliance with all procedures necessary for the safe operation of the equipment and attachments.

(2) Procedures for the operational controls shall be developed by a certified agent.

(3) Procedures related to the capacity of the equipment shall be developed and signed by a certified agent.

(e) The operator shall not engage in any practice or activity that diverts his/her attention while actually engaged in operating the equipment, such as the use of cellular phones (other than when used for signal communications).

(f) Tag-out.

(1) Tagging out of service equipment/functions. Where the employer has taken the equipment out of service, a tag shall be placed in the cab stating that the equipment is out of service and is not to be used. Where the employer has taken a function(s) out of service, a tag shall be placed in a conspicuous position stating that the function is out of service and is not to be used.

(2) Response to "do not operate"/tagout signs.

(A) If there is a warning (tag-out or maintenance/do not operate) sign on the equipment or starting control, the operator shall not activate the switch or start the equipment until the sign has been removed by a person authorized to remove it in accordance with the provisions of Section 3314.

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(B) If there is a warning (tag-out or maintenance/do not operate) sign on any other switch or control, the operator shall not activate that switch or control until the sign has been removed by a person authorized to remove it in accordance with the provisions of Section 3314.

(g) Before starting the engine, the operator shall verify that all controls are in the proper starting position and that all personnel are in the clear.

(h) Storm warning. When a local storm warning has been issued, the competent person shall determine whether it is necessary to implement manufacturer recommendations for securing the equipment.

(i) If equipment adjustments or repairs are necessary:

(1) The operator shall, in writing, promptly inform the person designated by the employer to receive such information and, where there are successive shifts, to the next operator; and

(2) The employer shall notify all affected employees, at the beginning of each shift, of the necessary adjustments or repairs and all alternative measures.

(j) Safety devices and operational aids shall not be used as a substitute for the exercise of professional judgment by the operator.

(k) The competent person shall adjust the equipment and/or operations to address the effect of wind, ice, and snow on equipment stability and rated capacity.

(l) Compliance with rated capacity.

(1) The equipment shall not be operated in excess of its rated capacity.

(2) The operator shall not be required to operate the equipment in a manner that would violate subsection (l)(1).

(m) Counterweight/ballast.

(1) Equipment shall not be operated without the counterweight or ballast in place as specified by the manufacturer.

(2) The maximum counterweight or ballast specified by the manufacturer for the equipment shall not be exceeded.

NOTE: Authority cited: Section 142.3, Labor Code. Reference: Section 142.3, Labor Code.

Add new Section 5010 as follows:

§5010. Fall Protection.

(a) Application.

(1) Subsections (b), (c)(3), (e) and (f) of this section apply to all equipment covered by General Industry Safety Orders, Group 13 except tower cranes.

(2) Subsections (c)(1), (c)(2), (d), and (g) of this section apply to all equipment covered by General Industry Safety Orders, Group 13.

(3) Subsections (c)(4) and (h) of this section apply only to tower cranes.

(b) Boom walkways.

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(1) Equipment manufactured after [Effective date plus one year] with lattice booms shall be equipped with walkways on the boom(s) if the vertical profile of the boom (from cord centerline to cord centerline) is 6 or more feet.

(2) Boom walkway criteria.

(A) The walkways shall be at least 12 inches wide.

(B) Guardrails, railings and other permanent fall protection attachments along boom walkways are:

1. Not required.

2. Prohibited on booms supported by pendant ropes or bars if the guardrails/railings/ attachments could be snagged by the ropes or bars.

3. Prohibited if of the removable type (designed to be installed and removed each time the boom is assembled/disassembled).

4. Where not prohibited, guardrails or railings shall be in accordance with Sections 3209 and 3210.

(c) Steps, handholds, ladders, grabrails, guardrails and railings.

(1) Construction Safety Orders, Article 16 (Railings) does not apply to equipment covered by General Industry Safety Orders, Group 13.

(2) The employer shall maintain in good condition originally-equipped steps, handholds, ladders and guardrails/railings/grabrails.

(3) Equipment manufactured after [Effective date plus one year] shall be equipped so as to provide safe access and egress between the ground and the operator work station(s), including the forward and rear positions, by the provision of devices such as steps, handholds, ladders, and guardrails/ railings/grabrails. These devices shall meet the following criteria:

(A) Steps, handholds, ladders and guardrails/railings/grabrails shall meet the criteria of SAE J185 (May 2003) (incorporated by reference) or ISO 11660-2:1994(E) (incorporated by reference) except where infeasible.

(B) Walking/stepping surfaces, except for crawler treads, shall have slip-resistant features/properties (such as diamond plate metal, strategically placed grip tape, expanded metal, or slip-resistant paint).

(4) Tower cranes manufactured after [Effective date plus one year] shall be equipped so as to provide safe access and egress between the ground and the cab, machinery platforms, and tower (mast), by the provision of devices such as steps, handholds, ladders, and guardrails/railings/grabrails. These devices shall meet the following criteria:

(A) Steps, handholds, ladders, and guardrails/railings/grabrails shall meet the criteria of ISO 11660-1:2008(E) (incorporated by reference) and ISO 11660-3:2008(E) (incorporated by reference) or SAE J185 (May 2003) (incorporated by reference) except where infeasible.

(B) Walking/stepping surfaces shall have slip-resistant features/properties (such as diamond plate metal, strategically placed grip tape, expanded metal, or slip-resistant paint).

(d) Personal fall arrest and fall restraint systems.



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Personal fall arrest system components shall be used in personal fall arrest and fall restraint systems and shall conform to the criteria in §1670 except that §1670(b)(10) does not apply to components used in personal fall arrest and fall restraint systems.

(e) For non-assembly/disassembly work, the employer shall provide and ensure the use of fall protection equipment for employees who are on a walking/working surface with an unprotected side or edge more than 7-1/2 feet above a lower level as follows:

(1) When moving point-to-point:

(A) On non-lattice booms (whether horizontal or not horizontal).

(B) On lattice booms that are not horizontal.

EXCEPTION: On horizontal lattice booms where the fall distance is less than 15 feet.

(2) While at a work station on any part of the equipment (including the boom, of any type), except when the employee is at or near draw-works (when the equipment is running), in the cab, or on the deck.

(f) For assembly/disassembly work, the employer shall provide and ensure the use of fall protection equipment for employees who are on a walking/working surface with an unprotected side or edge more than 15 feet above a lower level, except when the employee is at or near draw-works (when the equipment is running), in the cab, or on the deck.

(g) Anchorage criteria.

(1) Sections §1670(b)(10) and 1670(c)(4) apply to equipment covered by this section only to the extent delineated in subsection (g)(2).

(2) Anchorages for personal fall arrest and positioning device systems.

(A) Personal fall arrest systems shall be anchored to any apparently substantial part of the equipment unless a competent person, from a visual inspection, would conclude that the criteria in § 1670(b)(10) would not be met.

(B) Positioning device systems shall be anchored to any apparently substantial part of the equipment unless a competent person, from a visual inspection, would conclude that the criteria in §1670(c)(4) would not be met.

(C) Attachable anchor devices (portable anchor devices that are attached to the equipment) shall meet the anchorage criteria in §1670(b)(10) for personal fall arrest systems and §1670(c)(4) for positioning device systems.

(3) Anchorages for fall restraint systems. Fall restraint systems shall be anchored to any part of the equipment that is capable of withstanding twice the maximum load that an employee may impose on it during reasonably anticipated conditions of use.

(h) Tower cranes.

(1) For work other than erecting, climbing, and dismantling, the employer shall provide and ensure the use of fall protection equipment for employees who are on a walking/working surface with an unprotected side or edge more than 7-1/2 feet above a lower level, except when the employee is at or near draw-works (when the equipment is running), in the cab, or on the deck.

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(2) For erecting, climbing, and dismantling work, the employer shall provide and ensure the use of fall protection equipment for employees who are on a walking/working surface with an unprotected side or edge more than 15 feet above a lower level.

NOTE: Authority cited: Section 142.3, Labor Code. Reference: Section 142.3, Labor Code.

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Add new Article 98.1 as follows:

TITLE 8: Division 1, Chapter 4, Subchapter 7, General Industry Safety Orders  
Group 13. Cranes and Other Hoisting Equipment,  
Article 98.1. Safety Devices and Operational Aids

Add new Section 5015 as follows:

§5015. Safety Devices.

(a) Safety devices. The following safety devices are required on all equipment covered by Group 13, unless otherwise specified: [NOTE: See Section 4968 for tower cranes.]

(1) Crane level indicator.

(A) The equipment shall have a crane level indicator that is either built into the equipment or is available on the equipment.

(B) If a built-in crane level indicator is not working properly, it shall be tagged-out or removed. If a removable crane level indicator is not working properly, it shall be removed.

(C) This requirement does not apply to portal cranes, derricks, floating cranes/derricks and land cranes/derricks on barges, pontoons, vessels or other means of flotation.

(2) Boom stops, except for derricks and hydraulic booms.

(3) Jib stops (if a jib is attached), except for derricks.

(4) Equipment with foot pedal brakes shall have locks.

(5) Hydraulic outrigger jacks and hydraulic stabilizer jacks shall have an integral holding device/check valve.

(6) Equipment on rails shall have rail clamps and rail stops, except for portal cranes.

(7) Horn

(A) The equipment shall have a horn that is either built into the equipment or is on the equipment and immediately available to the operator.

(B) If a built-in horn is not working properly, it shall be tagged-out or removed. If a removable horn is not working properly, it shall be removed.

(b) Proper operation required.

Operations shall not begin unless all of the devices listed in this section are in proper working order. If a device stops working properly during operations, the operator shall safely stop operations. If any of the devices listed in this section are not in proper working order, the equipment shall be taken out of service and operations shall not resume until the device is again working properly. See §§5008 and 5008.1 (Operation). Alternative measures are not permitted to be used.

NOTE: Authority cited: Section 142.3, Labor Code. Reference: Section 142.3, Labor Code.

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Add new Section 5016 as follows:

§5016. Operational Aids.

(a) The devices listed in this section (“listed operational aids”) are required on all equipment covered by Group 13, unless otherwise specified. [NOTE: See Section 4968.1 for tower cranes.]

(1) The requirements in subsections (e)(1), (e)(2), and (e)(3) do not apply to articulating cranes.

(2) The requirements in subsections (d)(3), (e)(1), and (e)(4) apply only to those digger derricks manufactured after **Effective date plus one year**.

(b) Operations shall not begin unless the listed operational aids are in proper working order, except where an operational aid is being repaired the employer uses the specified temporary alternative measures. The time periods permitted for repairing defective operational aids are specified in subsections (d) and (e). More protective alternative measures specified by the crane/derrick manufacturer, if any, shall be followed.

(c) If a listed operational aid stops working properly during operations, the operator shall safely stop operations until the temporary alternative measures are implemented or the device is again working properly.

(d) Category I operational aids. Operational aids listed in this section that are not working properly shall be repaired no later than 7 calendar days after the deficiency occurs. Exception: If the employer documents that it has ordered the necessary parts within 7 calendar days of the occurrence of the deficiency, the repair shall be completed within 7 calendar days of receipt of the parts. See §5008.1(i) for additional requirements.

(1) Boom hoist limiting device.

(A) For equipment manufactured after December 16, 1969, a boom hoist limiting device is required.

Temporary alternative measures (use at least one).

One or more of the following methods shall be used:

1. Use a boom angle indicator.

2. Clearly mark the boom hoist cable (so that it can easily be seen by the operator) at a point that will give the operator sufficient time to stop the hoist to keep the boom within the minimum allowable radius. In addition, install mirrors or remote video cameras and displays if necessary for the operator to see the mark.

3. Clearly mark the boom hoist cable (so that it can easily be seen by a spotter) at a point that will give the spotter sufficient time to signal the operator and have the operator stop the hoist to keep the boom within the minimum allowable radius.

(B) If the equipment was manufactured on or before December 16, 1969, and is not equipped with a boom hoist limiting device, at least one of the following measures shall be used:

1. Use a boom angle indicator.

2. Clearly mark the boom hoist cable (so that it can easily be seen by the operator) at a point that will give the operator sufficient time to stop the hoist to keep the boom within the

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minimum allowable radius. In addition, install mirrors or remote video cameras and displays if necessary for the operator to see the mark.

3. Clearly mark the boom hoist cable (so that it can easily be seen by a spotter) at a point that will give the spotter sufficient time to signal the operator and have the operator stop the hoist to keep the boom within the minimum allowable radius.

(2) Luffing jib limiting device. Equipment with a luffing jib shall have a luffing jib limiting device.

Temporary alternative measures are the same as in subsection (d)(1)(A), except to limit the movement of the luffing jib rather than the boom hoist.

(3) Anti two-blocking device.

(A) Telescopic boom cranes manufactured after February 28, 1992, shall be equipped with a device which automatically prevents damage from contact between the load block, overhaul ball, or similar component, and the boom tip (or fixed upper block or similar component). The device(s) shall prevent such damage at all points where two-blocking could occur.

(B) Lattice boom cranes.

1. Lattice boom cranes manufactured after Feb 28, 1992, shall be equipped with a device that either automatically prevents damage and load failure from contact between the load block, overhaul ball, or similar component, and the boom tip (or fixed upper block or similar component), or warns the operator in time for the operator to prevent two-blocking. The device shall prevent such damage/failure or provide adequate warning for all points where two-blocking could occur.

2. Lattice boom cranes and derricks manufactured after [Effective date plus one year] shall be equipped with a device which automatically prevents damage and load failure from contact between the load block, overhaul ball, or similar component, and the boom tip (or fixed upper block or similar component). The device(s) shall prevent such damage/failure at all points where two-blocking could occur.

EXCEPTION. The requirements in subsection (d)(3)(B) do not apply to such lattice boom equipment when used for dragline, clamshell (grapple), magnet, and drop ball work.

(C) Articulating cranes manufactured after December 31, 1999, that are equipped with a load hoisting device (winch) shall be equipped with a device that automatically prevents damage from contact between the load block, overhaul ball, or similar component, and the boom tip (or fixed upper block or similar component). The device shall prevent such damage at all points where two-blocking could occur.

(e) Category II operational aids and alternative measures. Operational aids listed in this subsection that are not working properly shall be repaired no later than 30 calendar days after the deficiency occurs.

EXCEPTION: If the employer documents that it has ordered the necessary parts within 7 calendar days of the occurrence of the deficiency, and the part is not received in time to complete the repair in 30 calendar days, the repair shall be completed within 7 calendar days of receipt of the parts. See §5008.1(i) for additional requirements.

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(1) Cranes shall be provided with a boom angle or radius indicator which clearly shows the boom angle in degrees to the operator at all times.

EXCEPTION: When a boom angle or radius indicator is inoperative or malfunctioning, a qualified person shall determine the radius or boom angle by measurement until the indicator is restored to operation.

(A) Boom angle or radius indicators shall be repaired in accordance with the manufacturer's recommendations.

(2) Jib angle indicator if the equipment has a luffing jib.

Temporary alternative measures: Radii or jib angle shall be determined by a qualified person ascertaining the main boom angle and then measuring the radii or jib angle with a measuring device.

(A) Jib angle or radius indicators shall be repaired in accordance with the manufacturer's recommendations.

(3) Boom length indicator if the equipment has a telescopic boom, except where the rated capacity is independent of the boom length.

Temporary alternative measures. One or more of the following methods shall be used:

(A) Mark the boom with measured marks to calculate boom length.

(B) Calculate boom length from boom angle and radius measurements.

(C) Measure the boom with a measuring device.

(4) Load weighing and similar devices.

(A) Equipment (other than derricks and articulating cranes) manufactured after March 29, 2003 with a rated capacity over 6,000 pounds shall have at least one of the following: load weighing device, load moment (or rated capacity) indicator, or load moment (or rated capacity) limiter.

EXCEPTION: When installed load indicating devices are not functional, a qualified person shall determine load weights until the device is restored to operation. When installed load indicating devices are not functional, a qualified person shall determine load weights until the device is restored to operation.

(1) Load indicating devices shall be repaired in accordance with the manufacturer's recommendations.

(B) Articulating cranes manufactured after [Effective date plus one year] shall have at least one of the following: automatic overload prevention device, load weighing device, load moment (or rated capacity) indicator, or load moment (rated capacity) limiter.

Temporary alternative measures: The weight of the load shall be determined from a source recognized by the industry (such as the load's manufacturer) or by a calculation method recognized by the industry (such as calculating a steel beam from measured dimensions and a known per foot weight). This information shall be provided to the operator prior to the lift.

(5) The following devices are required on equipment manufactured after [Effective date plus one year]:

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(A) Outrigger/stabilizer position (horizontal beam extension) sensor/monitor if the equipment has outriggers or stabilizers.

Temporary alternative measures: The operator shall verify that the position of the outriggers or stabilizers is correct (in accordance with manufacturer procedures) before beginning operations requiring outrigger or stabilizer deployment.

(B) Hoist drum rotation indicator if the equipment has a hoist drum not visible from the operator's station.

Temporary alternative measures: Mark the drum to indicate the rotation of the drum. In addition, install mirrors or remote video cameras and displays if necessary for the operator to see the mark.

NOTE: Authority cited: Section 142.3, Labor Code. Reference: Section 142.3, Labor Code.

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TITLE 8: Division 1, Chapter 4, Subchapter 7, General Industry Safety Orders  
Group 13. Cranes and Other Hoisting Equipment, Article 99. Testing

Amend Section 5022 to read:

§5022. Proof Load Test and Examination of Cranes and Their Accessory Gear.

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(d) An examination shall be carried out in conjunction with each proof load test. The certifying agency shall make a determination as to requirements for the correction of deficiencies found. The examination shall cover the following points ~~items listed for the Annual/Comprehensive Inspection (Section 5031.2) as applicable:~~

~~(1) All functional operating mechanisms for improper function, maladjustment, and excessive component wear, with particular attention to sheaves, pins, and drums. This shall include operation with partial load, in which all functions and movements, including, where applicable, maximum possible rotation in both directions, are performed. [Ed note: relocated to 5031.2(b)(2)]~~

~~(2) All safety devices for malfunction. [Ed note: Replaced by 5031.2(b)(4)]~~

~~(3) Deterioration or leakage in lines, tanks, valves, drains, pumps, and other parts of air or hydraulic systems. [Ed note: Replaced by 5031.2(b)(9)-(12)]~~

~~(4) Loose gear components (i.e. hooks, etc.), including wire rope and wire rope terminals and connections, with particular attention to sections of wire rope exposed to abnormal wear and sections not normally exposed for examination. Cracked or deformed hooks shall be discarded. [Ed note: relocated to 5031.2(b)(18)]~~

~~(5) Rope reeving for compliance with certified agent's recommendations. [Ed note: relocated to 5031.2(b)(19)]~~

~~(6) Deformed, cracked, or excessively corroded members in crane structure and boom.~~

~~(7) Loose bolts, rivets, or other connections.~~

~~(8) Worn, cracked, or distorted parts affecting safe operation. [Ed note: (d)(6)-(8) now covered by 5031.2(b)(1)]~~

~~(9) Excessive wear on and free operation of brake and clutch system parts, linings, pawls, and ratchets. [Ed note: relocated to 5031.2(b)(3)]~~

~~(10) Load, boom angle, or other indicators shall be checked for any inaccuracy. [Ed note: relocated to 5031.2(b)(17)]~~

~~(11) It shall be ascertained that there is a durable rating chart visible to the operator, covering the complete range of the certified agent's capacity ratings at all operating radii, for all permissible boom lengths and jib length, with alternate ratings for optional equipment affecting such ratings. Necessary precautions or warnings shall be included and operating controls marked or an~~



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~~explanation of controls shall be posted at the operator's position to indicate function. [Ed note: relocated to 5031.2(b)(16)(i)]~~

~~(12) Careful examination of the junction areas of removable boom sections, particularly for proper seating, cracks, deformities, or other defects in securing bolts and in the vicinity of such bolts. [Ed note: relocated to 5031.2(b)(1)(iv)]~~

~~(13) It shall be ascertained that no counterweights in excess of the certified agent's specifications are fitted. [Ed note: relocated to 5031.2(b)(20)]~~

~~(14) Such other examinations deemed necessary under the circumstances. [Ed note: relocated to 5031.2(b)(21)]~~

NOTE: Authority and reference cited: Section 142.3, Labor Code.

Amend Section 5023 to read:

§5023. Proof Load Test and Examination of Derricks and Their Accessory Gear.

\*\*\*

(d) The test load shall be hoisted a vertical distance to assure that the load is supported by the hoist and held by the hoist brake(s).

(e) The test load shall be lowered, stopped and held with the brake(s).

(f) The hoist shall not be used unless a licensed crane certifying agency determines that the test has been passed.

NOTE: Authority cited: Section 142.3, Labor Code. Reference: Section 142.3, Labor Code.

Amend Section 5027 to read:

~~§5027. Safe Working Load Reduction.~~ Equipment Modifications.

~~If the operation in which equipment is engaged never utilizes more than a fraction of the safe working load rating, the owner of such equipment may have the crane or derrick certificated for and operated at a lesser maximum safe working load in keeping with the use and based on radius and other pertinent factors; provided, however, that the equipment concerned is physically capable of operation at the load rating and load reduction is not for the purpose of avoiding correction of any deficiency. Load rating charts shall be changed accordingly.~~

(a) Modifications or additions which affect the capacity or safe operation of the equipment are prohibited except where the requirements of subsections (a)(1), (a)(2), (a)(3), (a)(4), or (a)(5) of this section are met.

(1) Manufacturer review and approval.

(A) The manufacturer approves the modifications/additions in writing.

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(B) The load charts, procedures, instruction manuals and instruction plates/tags/decals are modified as necessary to accord with the modification/addition.

(C) The original safety factor of the equipment is not reduced.

(2) Manufacturer refusal to review request. The manufacturer is provided a detailed description of the proposed modification/addition, is asked to approve the modification/addition, but it declines to review the technical merits of the proposal or fails, within 30 days, to acknowledge the request or initiate the review, and all of the following are met:

(A) A registered professional engineer who is a qualified person with respect to the equipment involved:

1. Approves the modification/addition and specifies the equipment configurations to which that approval applies, and

2. Modifies load charts, procedures, instruction manuals and instruction plates/tags/decals as necessary to accord with the modification/addition.

(B) The original safety factor of the equipment is not reduced.

(3) Unavailable manufacturer. The manufacturer is unavailable and the requirements of subsections (a)(2)(A) and (B) are met.

(4) Manufacturer does not complete the review within 120 days of the request. The manufacturer is provided a detailed description of the proposed modification/addition, is asked to approve the modification/addition, agrees to review the technical merits of the proposal, but fails to complete the review of the proposal within 120 days of the date it was provided the detailed description of the proposed modification/addition, and the requirements of subsections (a)(2)(A) and (B) are met.

(5) Multiple manufacturers of equipment designed for use on marine work sites. The equipment is designed for marine work sites, contains major structural components from more than one manufacturer, and the requirements of subsections (a)(2)(A) and (B) are met.

(b) Modifications or additions which affect the capacity or safe operation of the equipment are prohibited where the manufacturer, after a review of the technical safety merits of the proposed modification/addition, rejects the proposal and explains the reasons for the rejection in a written response. If the manufacturer rejects the proposal but does not explain the reasons for the rejection in writing, the employer may treat this as a manufacturer refusal to review the request under subsection (a)(2).

NOTE: Authority cited: Section 142.3, Labor Code. Reference: Section 142.3, Labor Code.

Repeal Section 5028 as follows:

~~§5028. Safe Working Load Increase.~~

~~In no case shall safe working loads be increased beyond the manufacturer's ratings or the original design limitations unless such increase meets with the manufacturer's approval. Where the manufacturer's services are not available, or where the equipment is of foreign manufacture,~~

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~~engineering design analysis by, or acceptable to, the certified agent is required. All necessary structural changes shall be carried out.~~

NOTE: Authority and reference cited: Section 142.3, Labor Code.

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TITLE 8: Division 1, Chapter 4, Subchapter 7, General Industry Safety Orders  
Group 13. Cranes and Other Hoisting Equipment, Article 100. Inspection and Maintenance

Amend Section 5031 to read:

§5031. Inspections – Daily.

(a) A qualified person shall visually inspect the crane's or derrick's controls, rigging and operating mechanism prior to the first operation on any work shift. The inspection shall consist of observation for apparent deficiencies. Taking apart equipment components and booming down is not required as part of this inspection unless the results of the visual inspection or trial operation indicate that further investigation necessitating taking apart equipment components or booming down is needed. Any unsafe conditions disclosed by the inspection requirements of this Article shall be corrected promptly. Defective components of equipment which create an imminent safety hazard shall be replaced, repaired or adjusted prior to use.

~~(b) Frequency of Inspections. Daily visual inspections by the operator or other qualified person shall be made of/for:~~

At a minimum the inspection shall include all of the following:

- (1) All functional mechanisms for maladjustment interfering with proper operation;
  - (A) Control mechanisms shall be inspected for maladjustments interfering with proper operation.
  - (B) Control and drive mechanisms shall be inspected for apparent excessive wear of components and contamination by lubricants, water or other foreign matter.
- (2) The operation of all limit switches without a load on the hook;
- (3) Lines, tanks, valves, pumps, and other parts of air or hydraulic systems for deterioration or leakage;
- (4) Hooks and latches for deformation, ~~and~~ cracks, excessive wear, or damage such as from chemicals or heat;
- (5) Hoist or load attachment chains including end connections for excessive wear, twist, distorted or stretched links interfering with proper function;
- (6) Excessive wear, broken wires, stretch, kinking, or twisting of ropes and rope slings, including end connections. Wire rope shall be inspected in accordance with §5031(a).
- (7) Wire rope reeving shall be inspected for compliance with the manufacturer's specifications.
- (8) Electrical apparatus for malfunctioning, signs of apparent excessive deterioration, dirt or moisture accumulation.
- (9) Tires (when in use) for proper inflation and condition.
- (10) Ground conditions around the equipment for proper support, including ground settling under and around outriggers/stabilizers and supporting foundations, ground water accumulation, or similar conditions.

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This section does not apply to the inspection of ground conditions for railroad tracks and their underlying support when the railroad tracks are part of the general railroad system of transportation that is regulated pursuant to the Federal Railroad Administration under 49 CFR part 213.

(11) The equipment for level position within the tolerances specified by the equipment manufacturer's recommendations, both before each shift and after each move and setup.

(12) Operator cab windows for significant cracks, breaks, or other deficiencies that would hamper the operator's view.

(13) Rails, rail stops, rail clamps and supporting surfaces when the equipment has rail traveling. This section does not apply to the inspection of rails, rail stops, rail clamps and supporting surfaces when the railroad tracks are part of the general railroad system of transportation that is regulated pursuant to the Federal Railroad Administration under 49 CFR part 213.

(14) Safety devices and operational aids for proper operation.

(b) If any deficiency in subsections (a)(1) through (13) (or in additional inspection items required to be checked for specific types of equipment in accordance with other sections of this standard) is identified, an immediate determination shall be made by the qualified person as to whether the deficiency constitutes a safety hazard. If the deficiency is determined to constitute a safety hazard, the equipment shall be taken out of service until it has been corrected.

(c) If any deficiency in subsection (a)(14) (safety devices/operational aids) is identified, the action specified in §5015 and §5016 shall be taken prior to using the equipment.

(e) Periodic inspections shall be conducted at least four times a year. The annual certification, as required by Section 5021(a), can serve as one of the required periodic inspections. The periodic inspections shall be evenly spaced or as close to evenly spaced as scheduling permits through the year. Cranes shall not be operated more than 750 hours, between periodic inspections. The inspection shall include the following in addition to the items in subsection (b) above:

(1) Excessive wear of all functional operating mechanisms.

(2) Ropes, brakes, friction clutches, chain drives, and other parts subject to wear which may be readily inspected.

(3) Cranes handling molten metal shall be inspected at least weekly when in use and necessary repairs made.

(4) An inspection record shall be maintained which includes the date of the inspection, the signature of the person who performed the inspection, and the serial number or other identifier of the crane inspected. The most recent inspection record shall be maintained on file. *[Ed note: existing 5031(c) relocated to 5031.2]*

(d) In any year in which no quadrennial (every four years) proof load test is required on cranes or derricks, such equipment shall be examined by a qualified person as described in Section 5021. Such examination shall be made not later than the anniversary date of the quadrennial certification, and shall conform with the requirements of Section 5022 (d) and the following:

*[Portion relocated to 5031.3(a)(1)]*

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~~(1) Crane hooks with cracks or with deformation of throat opening more than 15 percent in excess of normal opening or more than 10 degree twist from plane of unbent hook shall be removed from service. [Ed note: relocated to 5031.3(b)(19)]~~

~~(2) Ropes shall be inspected for proper lubrication, excessive wear, broken strands, and proper reeving. Note: Many variable factors are involved in determining the exact time for replacement of rope and timely replacement for safety. Conditions such as the following shall be sufficient reason for replacement:~~

~~1. In running ropes, 6 randomly distributed broken wires in one rope lay, or 3 broken wires in one strand in one lay.~~

~~2. Wear of 1/3 the original diameter of outside individual wires.~~

~~3. Kinking, crushing, bird caging, or other damage resulting in distortion of the rope structure. Evidence of any heat damage.~~

~~4. Reductions from nominal diameter of more than:~~

~~1/64 inch for diameters up to 5/16 inch~~

~~1/32 inch for diameters 3/8 inch to 1/2 inch~~

~~3/64 inch for diameters 9/16 inch to 3/4 inch~~

~~1/16 inch for diameters 7/8 inch to 1 1/8 inch~~

~~3/32 inch for diameters 1 1/4 inch to 1 1/2 inch~~

~~5. In standing ropes, more than 2 broken wires in one lay in sections beyond end connections or more than one broken wire at an end connection.~~

~~6. Reduction of rope diameter below nominal diameter due to loss of core support, internal or external corrosion, or wear of outside wires.~~

~~[Ed note: Content of Section 5031(d)(2) relocated (not verbatim) to section 5036(b)]~~

~~(3) In order to establish data for judging the proper time for replacement of hoisting rope, a continuing inspection record shall be maintained. The record shall cover factors of deterioration as listed in subsections (b), (c) and (d). [Ed note: This is covered in more detail in new section 5036]~~

~~(4) Whenever it is considered necessary by the certificating agency or authorized representative and whenever it is practical and advisable to avoid disassembly of equipment, removal of pins, etc., examination of structure or parts by electronic, ultrasonic, or other nondestructive methods shall be carried out. [Relocated to 5031.3(b)]~~

~~(e) All rope which has been idle for a period of a month or more due to shutdown or storage of a crane on which it is installed shall be given a thorough inspection before it is placed in service. This inspection shall be for all types of deterioration and shall be performed by a qualified person whose approval shall be required for further use of the rope. A certification record shall be made available for inspection which includes the date of inspection, the signature of the person who performed the inspection, and an identifier of the rope which was inspected. [Ed note: relocated to 5031.5(b)]~~

NOTE: Authority cited: Section 142.3, Labor Code. Reference: Section 142.3, Labor Code.

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Add new Section 5031.1 as follows:

§5031. 1. Inspections – Monthly.

(a) Each month the equipment is in service it shall be inspected in accordance with Section 5031 (Daily/Each Shift).

(b) Equipment shall not be used until an inspection under this section demonstrates that no corrective action under Section 5031(b) and (c) is required.

(c) Documentation.

(1) The following information shall be documented and maintained by the employer that conducts the inspection:

(A) The items checked and the results of the inspection.

(B) The name and signature of the person who conducted the inspection and the date.

(2) This document shall be retained for a minimum of three months.

NOTE: Authority cited: Section 142.3, Labor Code. Reference: Section 142.3, Labor Code.

Add new Section 5031.2 as follows:

§5031. 2. Inspections – Annual/Comprehensive.

(a) At least every 12 months the equipment shall be inspected by a licensed certifying agency in accordance with Section 5031 (Daily/each shift) except that the corrective action set forth in subsections (d), (e) and (f) shall apply in place of the corrective action required by Section 5031(b) and (c).

(1) Such examinations shall be made not later than the anniversary date of the quadrennial certification. *[This subsection relocated from 5031(d)]*

(b) In addition, at least every 12 months, equipment shall be inspected by a certifying agency. Disassembly is required, as necessary, to complete the inspection; however, whenever it is practical and advisable to avoid disassembly of equipment, removal of pins, etc., examination of structure or parts by electronic, ultrasonic, or other nondestructive methods shall be carried out. The equipment shall be inspected for all of the following: *[Ed note: portion about NDT has been relocated from 5031(d)(4)]*

(1) Equipment structure (including the boom and, if equipped, the jib):

(A) Structural members: Deformed, cracked, or significantly corroded.

(B) Bolts, rivets and other fasteners: loose, failed or significantly corroded.

(C) Welds for cracks.

(D) Junction areas of removable boom sections, particularly for proper seating, cracks, deformities, or other defects in securing bolts and in the vicinity of such bolts.

(2) All functional operating mechanisms for improper function, maladjustment, and excessive component wear, with particular attention to the following:

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- (A) Sheaves and drums for cracks or significant wear.
- (B) Parts such as pins, bearings, shafts, gears, rollers and locking devices for distortion, cracks or significant wear.
- NOTE: This shall include operation with partial load, in which all functions and movements, including, where applicable, maximum possible rotation in both directions, are performed.
- (3) Excessive wear on and free operation of brake and clutch system parts, linings, pawls, and ratchets.
- (4) Safety devices and operational aids for proper operation (including significant inaccuracies).
- (5) Gasoline, diesel, electric, or other power plants for safety-related problems (such as leaking exhaust and emergency shut-down feature) and conditions, and proper operation.
- (6) Chains and chain drive sprockets for excessive wear of sprockets and excessive chain stretch.
- (7) Travel steering, brakes, and locking devices, for proper operation.
- (8) Tires for damage or excessive wear.
- (9) Hydraulic, pneumatic and other pressurized hoses, fittings and tubing, as follows:
  - (A) Flexible hose or its junction with the fittings for indications of leaks.
  - (B) Threaded or clamped joints for leaks.
  - (C) Outer covering of the hose for blistering, abnormal deformation or other signs of failure/impending failure.
  - (D) Outer surface of a hose, rigid tube, or fitting for indications of excessive abrasion or scrubbing.
- (10) Hydraulic and pneumatic pumps and motors, as follows:
  - (A) Performance indicators: Unusual noises or vibration, low operating speed, excessive heating of the fluid, low pressure.
  - (B) Loose bolts or fasteners.
  - (C) Shaft seals and joints between pump sections for leaks.
- (11) Hydraulic and pneumatic valves, as follows:
  - (A) Spools: Sticking, improper return to neutral, and leaks.
  - (B) Leaks.
  - (C) Valve housing cracks.
  - (D) Relief valves: Failure to reach correct pressure (if there is a manufacturer procedure for checking pressure, it shall be followed).
- (12) Hydraulic and pneumatic cylinders, as follows:
  - (A) Drifting caused by fluid leaking across the piston.
  - (B) Rod seals and welded joints for leaks.
  - (C) Cylinder rods for scores, nicks, or dents.
  - (D) Case (barrel) for significant dents.
  - (E) Rod eyes and connecting joints: Loose or deformed.
- (13) Outrigger or stabilizer pads/floats for excessive wear or cracks.



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(14) Slider pads for excessive wear or cracks

(15) Electrical components and wiring for cracked or split insulation and loose or corroded terminations.

(16) Warning labels and decals originally supplied with the equipment by the manufacturer or otherwise required under this standard: Missing or unreadable.

(A) It shall be ascertained that there is a durable rating chart visible to the operator, covering the complete range of the certified agent's capacity ratings at all operating radii, for all permissible boom lengths and jib length, with alternate ratings for optional equipment affecting such ratings. Necessary precautions or warnings shall be included and operating controls marked or an explanation of controls shall be posted at the operator's position to indicate function.

(17) Originally equipped operator seat (or equivalent): Missing or unserviceable.

(18) Load, boom angle, or other indicators shall be checked for any inaccuracy.

(19) Loose gear components (i.e. hooks, etc.), including wire rope and wire rope terminals and connections, with particular attention to sections of wire rope exposed to abnormal wear and sections not normally exposed for examination.

(A) Crane hooks with cracks or with deformation of throat opening more than 15 percent in excess of normal opening or more than 10 degree twist from plane of unbent hook shall be removed from service.

(20) Rope reeving for compliance with certified agent's recommendations.

(21) It shall be ascertained that no counterweights in excess of the certified agent's specifications are fitted.

(22) Such other examinations deemed necessary under the circumstances.

(c) This inspection shall include functional testing to determine that the equipment as configured in the inspection is functioning properly.

(d) If any deficiency is identified, an immediate determination shall be made by the certifying agency as to whether the deficiency constitutes a safety hazard or, though not yet a safety hazard, needs to be monitored in the monthly inspections.

(e) If the certifying agency determines that a deficiency is a safety hazard, the equipment shall be taken out of service until it has been corrected, except when temporary alternative measures are implemented as specified in §5016(d) or §4968.1.

(f) If the certifying agency determines that, though not presently a safety hazard, the deficiency needs to be monitored, the employer shall ensure that the deficiency is checked in the monthly inspections.

(g) Documentation of annual/comprehensive inspection.

(1) The following information shall be documented, maintained, and retained for a minimum of 12 months, by the employer that conducts the inspection:

(A) The items checked and the results of the inspection.

(B) The name and signature of the person who conducted the inspection and the date.

EXCEPTION: Annual/Comprehensive inspections of Section 5031.2 may be performed by a

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qualified person for cranes not exceeding 3 tons rated capacity.

(2) Records required for crane certification shall be maintained in accordance with the provisions of Title 8, CCR Section 344.80(f).

NOTE: Authority cited: Section 142.3, Labor Code. Reference: Section 142.3, Labor Code.

Add new Section 5031.3 as follows:

§5031.3. Inspections – Severe Service.

Where the severity of use/conditions is such that there is a reasonable probability of damage or excessive wear (such as loading that may have exceeded rated capacity, shock loading that may have exceeded rated capacity, prolonged exposure to a corrosive atmosphere), the employer shall stop using the equipment and a certified agent shall:

(a) Inspect the equipment for structural damage to determine if the equipment can continue to be used safely.

(b) In light of the use/conditions determine whether any items/conditions listed in Section 5031.2 need to be inspected; if so, the certified agent shall inspect those items/conditions.

(c) If a deficiency is found, the employer shall follow the requirements in subsections 5031.2(d) through (f).

NOTE: Authority cited: Section 142.3, Labor Code. Reference: Section 142.3, Labor Code.

Add new Section 5031.4 as follows:

§5031.4. Inspections – Equipment Not in Regular Use.

(a) Equipment that has been idle for 3 months or more shall be inspected by a certified agent in accordance with the requirements of Section 5031.1 (Inspections – Monthly), before initial use.

(b) All rope which has been idle for a period of a month or more due to shutdown or storage of a crane on which it is installed shall be given a thorough inspection before it is placed in service. This inspection shall be for all types of deterioration and shall be performed by a certifying agency or qualified person whose approval shall be required for further use of the rope. A certification record shall be made available for inspection which includes the date of inspection, the signature of the person who performed the inspection, and an identifier of the rope which was inspected. *[Ed note: this subsection relocated from 5031(e)]*

(c) When certificated equipment is out of service for 6 months or more beyond the due date of a certification inspection, an examination equivalent to an initial certification, including proof load test, shall be performed before the equipment re-enters service. *[Relocated from 5022(a)(4)]*

NOTE: Authority cited: Section 142.3, Labor Code. Reference: Section 142.3, Labor Code.

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Add new Section 5031.5 as follows:

§5031.5. Inspections – Modified Equipment.

(a) Equipment that has had modifications or additions which affect the safe operation of the equipment (such as modifications or additions involving a safety device or operational aid, critical part of a control system, power plant, braking system, load sustaining structural components, load hook, or in-use operating mechanism) or capacity shall be inspected by a certifying agency after such modifications/additions have been completed, prior to initial use. The inspection shall meet all of the following requirements:

(1) The inspection shall assure that the modifications or additions have been done in accordance with the approval obtained pursuant to §5027 (Equipment Modifications).

(2) The inspection shall include functional testing of the equipment.

EXCEPTION: These inspections may be performed by a qualified person for cranes not exceeding 3 tons rated capacity.

(b) Equipment shall not be used until an inspection under this section demonstrates that the requirements of subsection (a)(1) have been met.

NOTE: Authority cited: Section 142.3, Labor Code. Reference: Section 142.3, Labor Code.

Add new Section 5031.6 as follows:

§5031.6. Inspections – Post-Assembly.

(a) Upon completion of assembly, the equipment shall be inspected by a qualified person or certifying agency to assure that it is configured in accordance with manufacturer equipment criteria.

(b) Where manufacturer equipment criteria are unavailable, a qualified person or certifying agency shall:

(1) Determine if a registered professional engineer (RPE) familiar with the type of equipment involved is needed to develop criteria for the equipment configuration. If an RPE is not needed, the employer shall ensure that the criteria are developed by the certified agent. If an RPE is needed, the employer shall ensure that they are developed by an RPE.

(2) Determine if the equipment meets the criteria developed in accordance with subsection (b)(1).

(c) Equipment shall not be used until an inspection under this section demonstrates and documents that the equipment is configured in accordance with the applicable criteria.

EXCEPTION: These inspections may be performed by a qualified person for cranes not exceeding 3 tons rated capacity.

NOTE: Authority cited: Section 142.3, Labor Code. Reference: Section 142.3, Labor Code.

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Modify Section 5032 to read:

§5032. ~~Molten Metal Cranes. [Repealed]~~ Inspections – General.

(a) Any part of a manufacturer's procedures regarding inspections that relate to safe operation (such as to a safety device or operational aid, critical part of a control system, power plant, braking system, load-sustaining structural components, load hook, or in-use operating mechanism) that is more comprehensive or has a more frequent schedule of inspection than the requirements of this Article shall be followed.

(b) All documents produced under this Article shall be available, during the applicable document retention period, to all persons who conduct inspections under this Article.

NOTE: Authority cited: Section 142.3, Labor Code. Reference: Section 142.3, Labor Code.

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Add new Section 5034.1 as follows:

§5034.1. Inspections – Repaired/Adjusted Equipment.

(a) Equipment that has had a repair or adjustment that relates to safe operation (such as: A repair or adjustment to a safety device or operator aid, or to a critical part of a control system, power plant, braking system, load-sustaining structural components, load hook, or in-use operating mechanism), shall be inspected by a qualified person or certifying agency after such a repair or adjustment has been completed, prior to initial use. The inspection shall meet all of the following requirements:

(1) The qualified person or certifying agency shall determine if the repair/adjustment meets manufacturer equipment criteria (where applicable and available).

(2) Where manufacturer equipment criteria are unavailable or inapplicable, the qualified person or certifying agency shall:

(A) Determine if a registered professional engineer (RPE) is needed to develop criteria for the repair/adjustment. If an RPE is not needed, the employer shall ensure that the criteria are developed by the certified agent. If an RPE is needed, the employer shall ensure that they are developed by an RPE.

(B) Determine if the repair/adjustment meets the criteria developed in accordance with subsection (a)(2)(A).

(3) The inspection shall include functional testing of the repaired/adjusted parts and other components that may be affected by the repair/adjustment.

(b) Equipment shall not be used until an inspection under this section demonstrates that the repair/adjustment meets the requirements of subsection (a)(1) [or, where applicable, subsection (a)(2)].

NOTES: 1. These inspections may be performed by a qualified person for cranes not exceeding 3 tons rated capacity.

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2. Proof load tests are required in the case of major modifications or repairs to important structural components, see Section 5022.

NOTE: Authority cited: Section 142.3, Labor Code. Reference: Section 142.3, Labor Code.

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Add new Article 100.1 as follows:

TITLE 8: Division 1, Chapter 4, Subchapter 7, General Industry Safety Orders  
Group 13. Cranes and Other Hoisting Equipment, Article 100.1. Wire Rope

Add new Section 5036 as follows:

§5036. Wire Rope Inspections.

(a) Shift inspection.

(1) A qualified person shall visually inspect the crane's or derrick's wire rope and rigging prior to the first operation on any work shift. Any unsafe conditions disclosed by the inspection requirements of this Article shall be corrected promptly. Defective components of equipment which create an imminent safety hazard shall be replaced, repaired or adjusted prior to use. The inspection shall consist of observation of wire ropes (running and standing) that are likely to be in use during the shift for apparent deficiencies, including those listed in subsection (a)(2). Untwisting (opening) of wire rope or booming down is not required as part of this inspection.

(2) Apparent deficiencies.

(A) Category I. Apparent deficiencies in this category include the following:

1. Significant distortion of the wire rope structure such as kinking, crushing, unstranding, birdcaging, signs of core failure or steel core protrusion between the outer strands.
2. Significant corrosion.
3. Electric arc damage (from a source other than power lines) or heat damage.
4. Improperly applied end connections.
5. Significantly corroded, cracked, bent, or worn end connections (such as from severe service).

(B) Category II. Apparent deficiencies in this category are:

1. Visible broken wires, as follows:

- a. In running wire ropes: Six randomly distributed broken wires in one rope lay or three broken wires in one strand in one rope lay, where a rope lay is the length along the rope in which one strand makes a complete revolution around the rope.
- b. In rotation resistant ropes: Two randomly distributed broken wires in six rope diameters or four randomly distributed broken wires in 30 rope diameters.
- c. In pendants or standing wire ropes: More than two broken wires in one rope lay located in rope beyond end connections and/or more than one broken wire in a rope lay located at an end connection.

2. A diameter reduction of more than 5% from nominal diameter.

(C) Category III. Apparent deficiencies in this category include the following:

1. In rotation resistant wire rope, core protrusion or other distortion indicating core failure.

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- 2. Prior electrical contact with a power line.
- 3. A broken strand.
- (3) Critical review items. The qualified person shall give particular attention to all of the following:
  - 1. Rotation resistant wire rope in use.
  - 2. Wire rope being used for boom hoists and luffing hoists, particularly at reverse bends.
  - 3. Wire rope at flange points, crossover points and repetitive pickup points on drums.
  - 4. Wire rope at or near terminal ends.
  - 5. Wire rope in contact with saddles, equalizer sheaves or other sheaves where rope travel is limited.
- (4) Removal from service.
  - 1. If a deficiency in Category I [see subsection (a)(2)(A)] is identified, an immediate determination shall be made by the qualified person as to whether the deficiency constitutes a safety hazard. If the deficiency is determined to constitute a safety hazard, operations involving use of the wire rope in question shall be prohibited until:
    - a. The wire rope is replaced, or
    - b. If the deficiency is localized, the problem is corrected by severing the wire rope in two; the undamaged portion may continue to be used. Joining lengths of wire rope by splicing is prohibited. If a rope is shortened under this section, the employer shall ensure that the drum will still have two wraps of wire when the load and/or boom is in its lowest position.
  - 2. If a deficiency in Category II [see subsection (a)(2)(B)] is identified, operations involving use of the wire rope in question shall be prohibited until:
    - a. The employer complies with the wire rope manufacturer's established criterion for removal from service or a different criterion that the wire rope manufacturer has approved in writing for that specific wire rope,
    - b. The wire rope is replaced, or
    - c. If the deficiency is localized, the problem is corrected by severing the wire rope in two; the undamaged portion may continue to be used.  
Joining lengths of wire rope by splicing is prohibited. If a rope is shortened under this section, the employer shall ensure that the drum will still have two wraps of wire when the load and/or boom is in its lowest position.
  - 3. If a deficiency in Category III is identified, operations involving use of the wire rope in question shall be prohibited until:
    - a. The wire rope is replaced, or
    - b. If the deficiency (other than power line contact) is localized, the problem is corrected by severing the wire rope in two; the undamaged portion may continue to be used. Joining lengths of wire rope by splicing is prohibited.  
Repair of wire rope that contacted an energized power line is also prohibited. If a rope is shortened under this section, the employer shall ensure that the drum will still have two wraps of wire when the load and/or boom is in its lowest position.

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4. Where a wire rope is required to be removed from service under this section, either the equipment (as a whole) or the hoist with that wire rope shall be tagged-out, in accordance with §5008.1(f)(1), until the wire rope is repaired or replaced.

(b) Monthly inspection.

(1) Each month an inspection shall be conducted in accordance with subsection (a) [Shift Inspection].

(2) The inspection shall include any deficiencies that the qualified person who conducts the annual inspection determines under subsection (c)(3)(B) shall be monitored.

(3) Wire ropes on equipment shall not be used until an inspection under this section demonstrates that no corrective action under subsection (a)(4) is required.

(4) The inspection shall be documented according to §5031.1(c) [monthly inspection documentation].

(c) Annual/comprehensive.

(1) At least every 12 months, wire ropes in use on equipment shall be inspected by a qualified person in accordance with subsection (a) [Shift Inspection].

(2) In addition, at least every 12 months, the wire ropes in use on equipment shall be inspected by a qualified person, as follows:

(A) The inspection shall be for deficiencies of the types listed in subsection (a)(2).

(B) The inspection shall be complete and thorough, covering the surface of the entire length of the wire ropes, with particular attention given to all of the following:

1. Critical review items listed in subsection (a)(3).

2. Those sections that are normally hidden during shift and monthly inspections.

3. Wire rope subject to reverse bends.

4. Wire rope passing over sheaves.

EXCEPTION: In the event an inspection under subsection (c)(2) is not feasible due to existing set-up and configuration of the equipment (such as where an assist crane is needed) or due to site conditions (such as a dense urban setting), such inspections shall be conducted as soon as it becomes feasible, but no longer than an additional 6 months for running ropes and, for standing ropes, at the time of disassembly.

(3) If a deficiency is identified, an immediate determination shall be made by the qualified person as to whether the deficiency constitutes a safety hazard.

(A) If the deficiency is determined to constitute a safety hazard, operations involving use of the wire rope in question shall be prohibited until:

1. The wire rope is replaced, or

2. If the deficiency is localized, the problem is corrected by severing the wire rope in two; the undamaged portion may continue to be used.

Joining lengths of wire rope by splicing is prohibited. If a rope is shortened under this section, the employer shall ensure that the drum will still have two wraps of wire when the load and/or boom is in its lowest position.



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(B) If the qualified person determines that, though not presently a safety hazard, the deficiency needs to be monitored, the employer shall ensure that the deficiency is checked in the monthly inspections.

(4) The inspection shall be documented according to §5031.2(g) Inspections – Annual/Comprehensive.

(d) Rope lubricants that are of the type that hinder inspection shall not be used.

(e) All documents produced under this section shall be available, during the applicable document retention period, to all persons who conduct inspections under this section.

NOTE: Authority cited: Section 142.3, Labor Code. Reference: Section 142.3, Labor Code.

Add new Section 5037 as follows:

§5037. Wire Rope—Selection and Installation Criteria.

(a) Original equipment wire rope and replacement wire rope shall be selected and installed in accordance with the requirements of this section. Selection of replacement wire rope shall be in accordance with the recommendations of the wire rope manufacturer, the equipment manufacturer, or a qualified person.

(b) Wire rope design criteria: Wire rope (other than rotation resistant rope) shall comply with either Option (1) or Option (2), as follows:

(1) Option (1). Wire rope shall comply with section 5–1.7.1 of ASME B30.5–2004 except that subsection 5-1.7.1(c) shall not apply.

(2) Option (2). Wire rope shall be designed to have, in relation to the equipment’s rated capacity, a sufficient minimum breaking force and design factor so that compliance with the applicable inspection provisions in §5036 (Wire Rope Inspections) will be an effective means of preventing sudden rope failure.

(c) Wire rope shall be compatible with the safe functioning of the equipment.

(d) Boom hoist reeving.

(1) Fiber core ropes shall not be used for boom hoist reeving, except for derricks.

(2) Rotation resistant ropes shall be used for boom hoist reeving only where the requirements of subsection (e)(4)(B) are met.

(e) Rotation resistant ropes.

(1) Definitions.

(A) Type I rotation resistant wire rope (“Type I”). Type I rotation resistant rope is stranded rope constructed to have little or no tendency to rotate or, if guided, transmits little or no torque. It has at least 15 outer strands and comprises an assembly of at least three layers of strands laid helically over a center in two operations. The direction of lay of the outer strands is opposite to that of the underlying layer.

(B) Type II rotation resistant wire rope (“Type II”). Type II rotation resistant rope is stranded rope constructed to have significant resistance to rotation. It has at least 10 outer strands and

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comprises an assembly of two or more layers of strands laid helically over a center in two or three operations. The direction of lay of the outer strands is opposite to that of the underlying layer.

(C) Type III rotation resistant wire rope ("Type III"). Type III rotation resistant rope is stranded rope constructed to have limited resistance to rotation. It has no more than nine outer strands, and comprises an assembly of two layers of strands laid helically over a center in two operations. The direction of lay of the outer strands is opposite to that of the underlying layer.

(2) Requirements.

(A) Types II and III with an operating design factor of less than 5 shall not be used for duty cycle or repetitive lifts.

(B) Rotation resistant ropes (including Types I, II and III) shall have an operating design factor of no less than 3.5.

(C) Type I shall have an operating design factor of no less than 5, except where the wire rope manufacturer and the equipment manufacturer approves the design factor, in writing.

(D) Types II and III shall have an operating design factor of no less than 5, except where the requirements of subsection (e)(3) are met.

(3) When Types II and III with an operating design factor of less than 5 are used (for non-duty cycle, non-repetitive lifts), the following requirements shall be met for each lifting operation:

(A) A qualified person shall inspect the rope in accordance with §5036(a). The rope shall be used only if the qualified person determines that there are no deficiencies constituting a hazard. In making this determination, more than one broken wire in any one rope lay shall be considered a hazard.

(B) Operations shall be conducted in such a manner and at such speeds as to minimize dynamic effects.

(C) Each lift made under subsection (e)(3) shall be recorded in the monthly and annual inspection documents. Such prior uses shall be considered by the qualified person in determining whether to use the rope again.

(4) Additional requirements for rotation resistant ropes for boom hoist reeving.

(A) Rotation resistant ropes shall not be used for boom hoist reeving, except where the requirements of subsection (e)(4)(B) are met.

(B) Rotation resistant ropes may be used as boom hoist reeving when load hoists are used as boom hoists for attachments such as luffing attachments or boom and mast attachment systems. Under these conditions, all of the following requirements shall be met:

1. The drum shall provide a first layer rope pitch diameter of not less than 18 times the nominal diameter of the rope used.

2. The requirements in §5002.1(a) (irrespective of the date of manufacture of the equipment), and §5002.1(b).

(C) The requirements in ASME B30.5–2004 sections 5–1.3.2(a), (a)(2) through (a)(4), (b) and (d) except that the minimum pitch diameter for sheaves used in multiple rope reeving is 18

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times the nominal diameter of the rope used (instead of the value of 16 specified in section 5–1.3.2(d)).

(D) All sheaves used in the boom hoist reeving system shall have a rope pitch diameter of not less than 18 times the nominal diameter of the rope used.

(E) The operating design factor for the boom hoist reeving system shall be not less than five.

(F) The operating design factor for these ropes shall be the total minimum breaking force of all parts of rope in the system divided by the load imposed on the rope system when supporting the static weights of the structure and the load within the equipment's rated capacity.

(G) When provided, a power controlled lowering system shall be capable of handling rated capacities and speeds as specified by the manufacturer.

(f) Wire rope clips used in conjunction with wedge sockets shall be attached to the unloaded dead end of the rope only, except that the use of devices specifically designed for deadending rope in a wedge socket is permitted.

(g) Socketing shall be done in the manner specified by the manufacturer of the wire rope or fitting.

(h) Prior to cutting a wire rope, seizings shall be placed on each side of the point to be cut. The length and number of seizings shall be in accordance with the wire rope manufacturer's instructions.

NOTE: Authority cited: Section 142.3, Labor Code. Reference: Section 142.3, Labor Code.

Add new Section 5038 as follows:

§5038. Qualifications of Maintenance and Repair Employees.

(a) Maintenance, inspection and repair personnel are permitted to operate the equipment only where all of the following requirements are met:

(1) The operation is limited to those functions necessary to perform maintenance, inspect the equipment, or verify its performance.

(2) The personnel either:

(A) Operate the equipment under the direct supervision of an operator who meets the requirements of §5006.1 (Operator qualification and certification); or

(B) Are familiar with the operation, limitations, characteristics and hazards associated with the type of equipment.

(b) Maintenance and repair personnel shall meet the definition of a qualified person with respect to the equipment and maintenance/repair tasks performed.

NOTE: Authority cited: Section 142.3, Labor Code. Reference: Section 142.3, Labor Code.

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TITLE 8: Division 1, Chapter 4, Subchapter 7, General Industry Safety Orders  
Group 13. Cranes and Other Hoisting Equipment,  
Article 101.1. Hooks

Add new Section 5060 to read:

§5060. Hooks.

(a) Load hooks (including latched and unlatched types), ball assemblies and load blocks shall be of sufficient weight to overhaul the line from the highest hook position for boom or boom and jib lengths and the number of parts of the line in use.

(b) Hook and ball assemblies and load blocks shall be marked with their rated capacity and weight.

(c) Latching hooks.

(1) Hooks shall be equipped with latches.

EXCEPTION: Hooks without latches, or with latches removed or disabled, shall not be used unless:

1. A qualified person has determined that it is safer to hoist and place the load without latches (or with the latches removed/tied back).

2. Routes for the loads are pre-planned to ensure that no employee is required to work in the fall zone.

(2) The latch shall close the throat opening and be designed to retain slings or other lifting devices/accessories in the hook when the rigging apparatus is slack.

NOTE: Authority cited: Section 142.3, Labor Code. Reference: Section 142.3, Labor Code.

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TITLE 8: Division 1, Chapter 4, Subchapter 7, General Industry Safety Orders  
Group 26. Diving Operations, Article 153. Commercial Diving Operations

Amend Section 6060 to read:

§6060. Procedures During Dive.

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(b) Water Entry Exit.

(1) A means capable of supporting the diver shall be provided for entering and exiting the water.

(2) The means provided for exiting the water shall extend below the water surface.

(3) A means shall be provided to assist an injured diver from the water or into a bell.

EXCEPTION: This subsection shall not apply to SCUBA diving operations.

(4) Working with a diver. The employer shall meet the following additional requirements when working with a diver in the water:

(A) If a crane/derrick is used to get a diver into and out of the water, it shall not be used for any other purpose until the diver is back on board. When used for more than one diver, it shall not be used for any other purpose until all divers are back on board.

(B) The operator shall remain at the controls of the crane/derrick at all times.

(C) In addition to the requirements in Sections 5001-5001.2 (Signals), either:

1. A clear line of sight shall be maintained between the operator and tender; or

2. The signals between the operator and tender shall be transmitted electronically.

3. The means used to secure the crane/derrick to the vessel/flotation device (see section 4943(j)(5) shall not allow any amount of shifting in any direction.

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NOTE: Authority cited: Section 142.3, Labor Code. Reference: Section 142.3, Labor Code.